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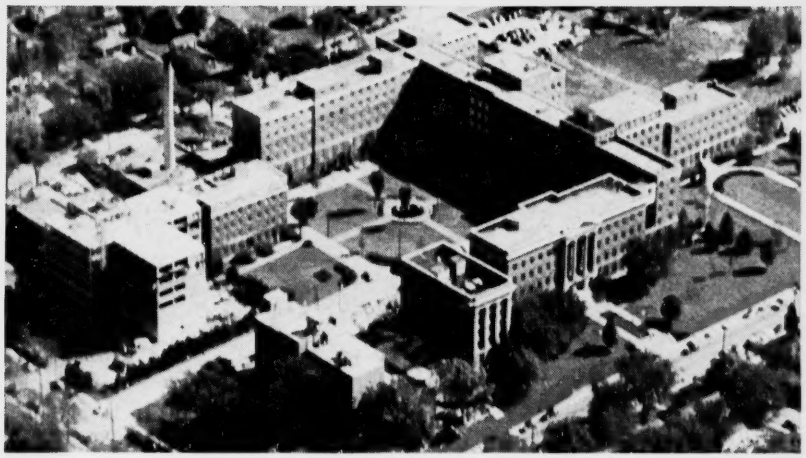

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Eighth Annual University of Kansas School of Medicine Number

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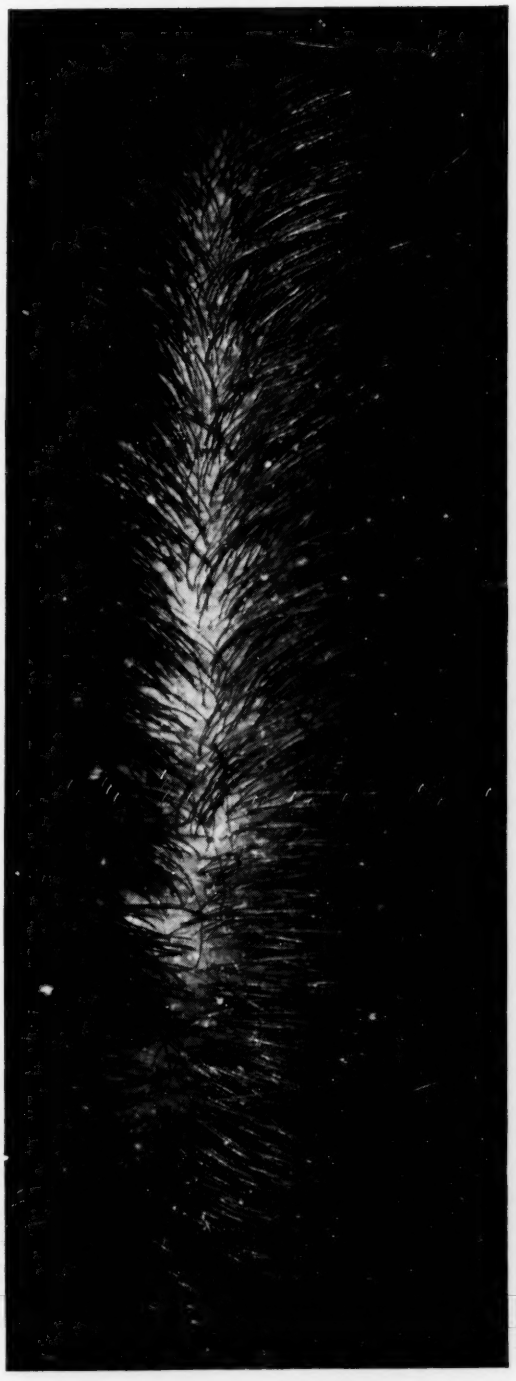

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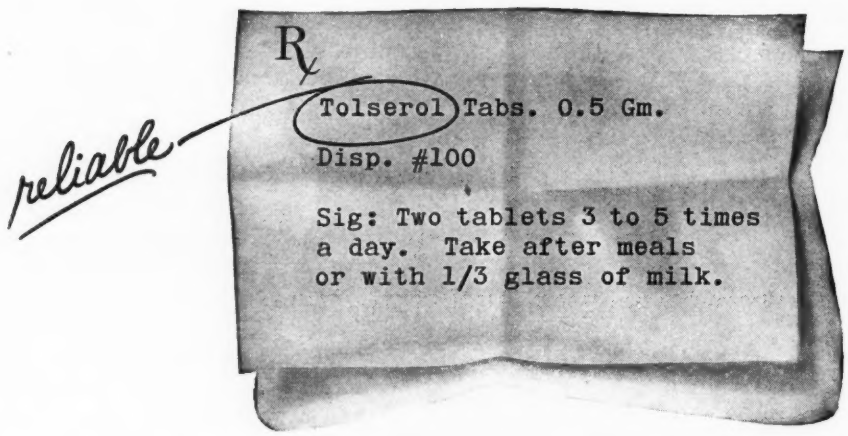

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Fractures of the Anterior Tibial Spine

L. O. Litton, M.D.
Kansas City, Kansas

Fractures of the anterior tibial spine are limited almost entirely to adolescence. It is not a common fracture, and the reason for its infrequency lies in the position of the anterior spine, which is inaccessible to direct trauma.

ANATOMY OF THE KNEE

To understand this fracture better, a review of the anatomy of the knee is necessary.[7, 8] The tibia at its articulation with the knee is composed of two surfaces, the medial and lateral condyles. These condyles are separated by a roughened, non-articulating area. The raised portion in the center of this area is the tibial spine or intercondyloid eminence. Situated on the tibial spine there are two flattened surfaces known as the anterior and posterior intercondyloid fossae.

The attachment of the anterior cruciate ligament is described differently by various anatomists. Blaisdell[1] found it attached to the anterior fossa blending with the lateral meniscus and passing obliquely upward, backward, and outward and inserting into the medial border of the lateral femoral condyle. Anderson[7] found, in 9 of 16 dissected cadavers, the tibial attachment of the anterior cruciate ligament was the anterior fossa and did not touch the anterior tubercle. In the remaining specimens there was some attachment to the tubercle. The anterior cruciate ligament resists forward displacement of the tibia on the femur and medial rotation of the tibia. In addition to the anterior spine serving as the attachment of the anterior cruciate ligament, it may limit side to side motion of the femur on the tibia.

MECHANISM OF INJURY

Isolated injuries to the anterior tibial spine are almost always the result of an abnormal stress effected on it by the anterior cruciate ligament. Injuries which in adults would cause rupture of the anterior cruciate ligament will result in avulsion of the anterior tibial spine in children. Callender's theory that "bone gives away before fibrous tissue" appears to hold here. This is particularly true in children where the anterior cruciate ligament is stronger than the soft cartilaginous anterior spine of the growing tibia.

That this fracture is produced by the same forces which cause injury to the anterior cruciate ligament was pointed out by Blaisdell.[1] The most common mechanism of injury is a fall or blow against the femur with the knee flexed and the tibia fixed. Another manner in which the anterior tibial spine may be avulsed is a forceable medial rotation of the tibia with the knee in extension. The anterior cruciate ligament avulses the tibial spine in attempting to resist this motion.

It is illogical to assume that rotational injury alone will result in the shearing off of the spine by the medial femoral condyle. If this were to occur, there must be a tear of the collateral ligament. One would also expect extensive damage to the articular surface in addition to the fracture of the spine. This has not been our experience. The only pathology found at open reduction is a cavity in the head of the tibia from which the anterior spine has been avulsed. The fragment is still attached to the ligament and has been retracted upward by the recoil of the ligament.

It is of interest that two of the three cases presented at this time were the result of bicycle accidents. Three of the five cases presented by Bradford et al.[9] were following bicycle accidents, and Christopher's case also was caused by a similar injury.

Department of Orthopedics, University of Kansas School of Medicine.

DIAGNOSIS

The diagnosis of such a fracture is not always easy. An accurate description of the mechanism of injury is usually difficult to obtain because of the age of the patient involved. Certainly a history of forceable medial rotation with the leg in extension, or a blow on the femur with the knee flexed and

Figure 1

tibia fixed, should make one suspicious of this fracture. There is always an immediate swelling of the knee caused by bleeding into the joint. There is an inability to extend the knee completely. Part of this may be due to the actual locking of the joint by the bone fragment, and part may be due to the loss of the anterior cruciate ligament in the so called "compulsory lateral rotary movement" of the tibia on the femur.

If the examination is done before pain and muscle spasm have occurred, it may be possible to demonstrate abnormal motion of the tibia on the femur. X-ray examination usually reveals the fracture as indicated in Figure 1. This shows the displacement of the fragment into the joint. The size of the fragment varies somewhat, occasionally appearing quite small due to the large amount of unossified cartilage present.

TREATMENT

Most standard orthopedic textbooks recommend closed reduction of this fracture as the treatment of choice. This reduction is accomplished by forcing the leg into full extension. Watson-Jones,[6] Clarke,[2] et al. report excellent results following this procedure. Certainly fractures of the anterior tibial spine with no displacement or with minimal displacement may be treated in this manner, and satisfactory results should be anticipated. Roth,[3] MacAusland[5] and Lee,[4] however, have all shown the impracticality of this method in cases in which displacement of the fragments has occurred. They point out that the anterior cruciate ligament is tight when in extension and hence lifts the fragment from its tibial site when the leg is forced into extension. We found no instance where the meniscus blocked the reduction as described by Roth.[3]

A median parapatellar incision is used for exposure with the distal end of the incision extending well down the tibia. The joint is opened in layers and inspected. The avulsed fragment is then easily replaced. Roth[3] states that fixation is not usually necessary. MacAusland[5] uses a screw for fixation. Lee[4] prefers suturing the fragment into place.

Our method[10] is similar to Lee's except for minor variants. Two drill holes are made on each side of the tibial tubercle and extend upward into the lateral borders of the fracture site. These holes should be on the outside edges of the fracture so that when the fragment is pulled into its bed it will not be held up by the suture. A heavy silk suture is then placed through one of the drill holes and up over the fragment or through it, depending on the size of the fragment. This suture is then pulled down through the other drill hole and through the skin and tied

Figure 2

over a button. Figure 2 shows the position of the pull-out suture and button. The wound is closed, and a cast from the toes to the groin is applied. At the end of about six weeks, the cast and pull-out suture is removed. Quadriceps exercises, of course, are in-

sisted upon during the period of immobilization. Figure 3 demonstrates the healed fracture about eight weeks after operation.

CASE REPORTS

Case 1. M. W., 9-year-old white female. About two weeks prior to admission, this patient was pushed from the bicycle she was riding and fell. She had immediate severe pain with swelling of the left knee. There was marked limitation of motion in extension at that time. There was a great deal of pain associated with attempted weight bearing and motion. X-ray showed an avulsion of the tibial spine. Closed reduction was attempted by placing the knee in complete extension. Check x-rays revealed inadequate reduction. On September 15, 1953, an arthrotomy of the left knee and reduction of the fracture was done by Dr. J. B. Weaver in the manner described above. The postoperative course was uneventful, and the pull-out sutures were removed in about six weeks. At present the patient has a painless knee with full range of motion.

Case 2, J. D., 9-year-old white female. About 10 days prior to admission, the patient fell from her bicycle and injured her left knee. Movement of the knee greatly aggravated the pain, and there was restriction of motion. There was a great deal of swelling of the knee. The knee was placed in as much extension as possible in a long leg cast. Check x-rays revealed some increase in displacement of the fragment. On August 26, 1953, an arthrotomy of the left knee was done by Dr. J. B. Weaver, and the fragment was replaced in the manner described above. Pull-out sutures were removed in about six weeks, and the patient now has a stable knee with full range of painless motion.

Case 3, J. L., 8-year-old white female. The day of admission the patient was pushed from behind and fell to the ground. She had immediate severe pain in the left knee with limitation of extension. X-rays revealed a displaced fracture of the anterior tibial spine. On September 16, 1953, an open reduction was done, and the fragment was replaced in the manner described above except that No. 30 wire was used as the pull-out suture. This wire broke in the subcutaneous region during the period of immobilization and has been left in. This will probably have to be removed at a later date. The fracture has healed, and to date the patient is ambulatory with full flexion and full extension and has no instability or pain.

SUMMARY

1. Fractures of the anterior tibial spine occur most commonly in children.

2. This fracture is the result of an abnormal stress effected on the anterior tibial spine region by the anterior cruciate ligament.

3. Open reduction is the preferred method of treatment in cases with displacement of the fragment.

4. A new method is described to fix the fragment into its tibial site.

5. Three cases are presented to illustrate points in diagnosis and treatment.

Figure 3

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No matter what looms ahead, if you can eat today, enjoy the sunlight today, mix good cheer with friends today, enjoy it and bless God for it. Do not look back on happiness—or dream of it in the future. You are only sure of today; do not let yourself be cheated out of it.

—Henry Ward Beecher

Complications Following Mitral Commissurotomy with Special Reference to Auricular Fibrillation

E. Grey Dimond, M.D., and Everton Marques dos Santos, M.D.

Kansas City, Kansas

We have observed a complication occurring sufficiently often in the postoperative period of mitral commissurotomy to warrant comment. This problem in postoperative management relates to auricular fibrillation.

Recently a paper appeared concerning the development and management of arrhythmias during finger fracture mitral valvuloplasty.[1] Although these acute arrhythmias are disturbing, it is surprising how often they terminate spontaneously. They seldom interfere with the completion of the operative procedure. The arrhythmias that develop either immediately postoperative or in the first few recovery days present a new problem for the clinician, one which seems unique in this type of surgery.

We have selected for mitral commissurotomy 52 cases in the past 21 months. Somewhat to our surprise, the arrhythmia which presented a problem was the occurrence of auricular fibrillation in the postoperative period in patients who had had normal sinus rhythm prior to the valve repair.

Of the 52 patients, 28 had normal sinus rhythm prior to the operation; 8 of these 28 patients developed auricular fibrillation within the first week after the operation.

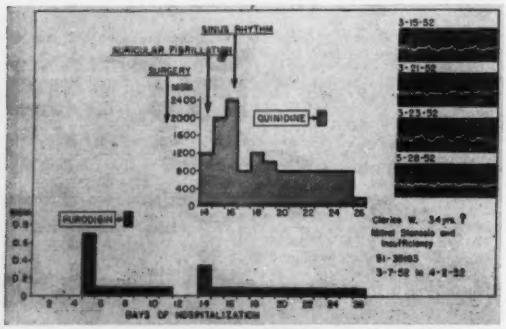

Figure 1.

CASE REPORTS

Case 1, C. W., white female, age 34, KUMC No. 51-35183. Mitral stenosis with minimal insufficiency. Hemoptysis one time. Paroxysmal dyspnea several times. Episodes of palpitation associated with dyspnea lasting one to two hours, starting abruptly and stopping suddenly. Normal sinus rhythm. Operated upon March 19, 1952. On March 21, patient suddenly became weak and began to perspire. Apical rate was 140 and radial rate 68. EKG confirmed auricular

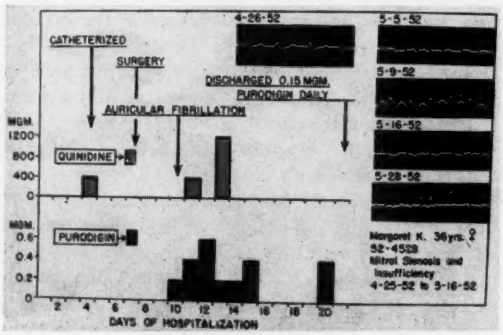

Figure 2.

fibrillation. The subsequent course and management is diagrammed in Figure 1. Biopsy of the auricular appendage revealed chronic endocarditis, mild pericarditis (rheumatic fever), and auricular hypertrophy.

Case 2, M. K., white female, age 36, KUMC No. 52-4528. Mitral stenosis. Shortness of breath on exertion for the past eight years. Normal sinus rhythm. Underwent mitral commissurotomy on May 2, 1952. On May 5 the heart rhythm was found to be irregular with a rate of 160, and the EKG revealed an impure flutter. The attempt at conversion is diagrammed in Figure 2. The patient insisted upon leaving the hospital and was released without further adequate attempt at conversion. Biopsy of the auricular appendage showed hypertrophy of auricular muscle. No evidence of activity.

Case 3, M. S., white female, age 41, KUMC No. 52-7402. Mitral stenosis. Shortness of breath in the last five years. Occasional episodes of palpitation unrelieved by Pronestyl or digitalis. Normal sinus rhythm. Operated upon June 27, 1952. On the day following surgery it was noted that the patient was fibrillating. Conversion was achieved, but auricular fibrillation recurred two times before the normal

From the Department of Medicine, University of Kansas School of Medicine.

sinus rhythm could be maintained. The management of this patient is summarized on Figure 3. Biopsy of the auricular appendage revealed focal myocardial hypertrophy, no evidence of activity.

Case 4, I. H., white female, age 41, KUMC No. 52-13317. Mitral stenosis with minimal aortic involvement. Shortness of breath in the last year. Occasional ankle edema. Normal sinus rhythm. On November 24, 1952, the patient had a mitral finger fracture valvuloplasty. Fibrillation occurred on November 27. The subsequent course and management is shown on Figure 4. The biopsy of the amputated portion of the auricular appendage revealed hypertrophy of the auricular appendage, chronic endocarditis, and the presence of atypical Aschoff bodies.

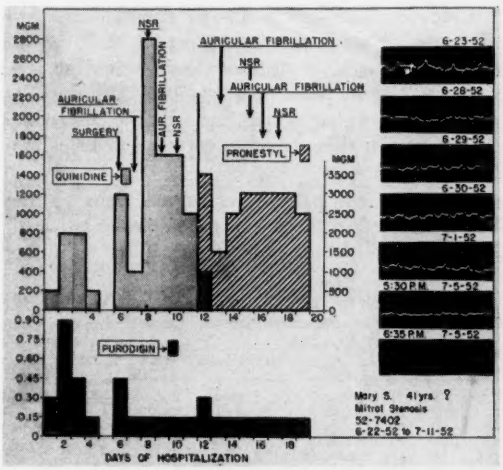

Figure 3.

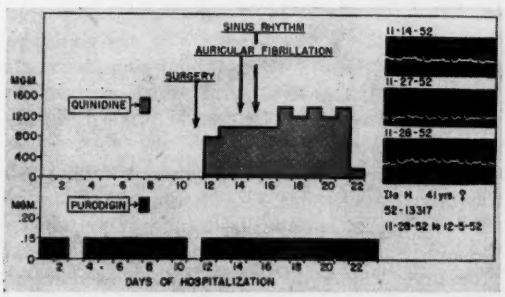

Figure 4.

Case 5, G. L., white male, age 38, KUMC No. 52-13393. Mitral stenosis and aortic stenosis. Came in for "heart operation" because he couldn't get a full breath. Normal sinus rhythm. On November 26, auricular fibrillation developed and was the cause of the prolonged hospitalization of this patient, requiring his further readmission two days after being discharged. The management of this patient's arrhythmia is outlined in Figure 5. Biopsy of the auricular appendage revealed hypertrophy of the auricular appendage, no evidence of activity.

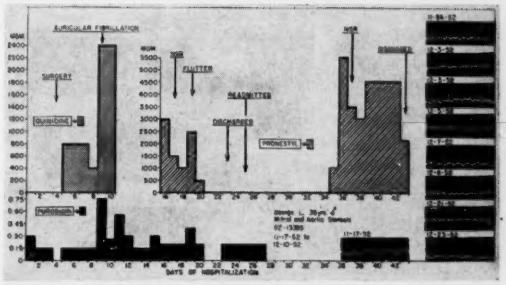

Figure 5.

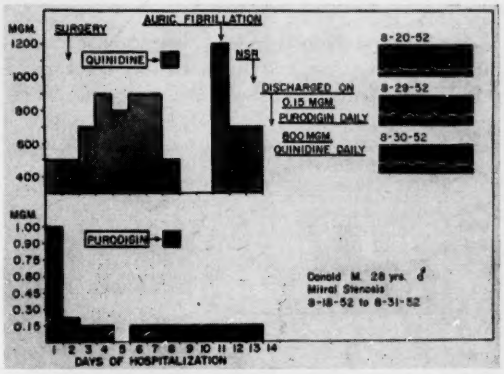

Figure 6.

Case 6, D. M., white male, age 28, KUMC No. 52-7314. Mitral stenosis. Shortness of breath on exertion for one year. Normal sinus rhythm. Surgery deferred two times because of question of rheumatic activity. It finally was done on August 20, 1952. On August 29, the patient was found to be fibrillating. The summary of medication and subsequent course is shown in Figure 6. Biopsy of the auricular appendage revealed evidences of mild chronic pancarditis.

Case 7, J. M., white female, age 27, KUMC No. 53-5850. Pure mitral stenosis discovered nine months ago during pregnancy. The patient had minimal dyspnea at that time, though a cesarean section for placenta previa was done without difficulty. Patient had shortness of breath at exertion on admission here. Mitral commissurotomy was done on May 11, 1953. The next day the patient was found to be fibrillating. Because of nausea, quinidine was not given, but she received additional doses of digitalis. On May 18, 1953, the patient spontaneously reverted to sinus rhythm. Histological pathology reported mild chronic endocarditis.

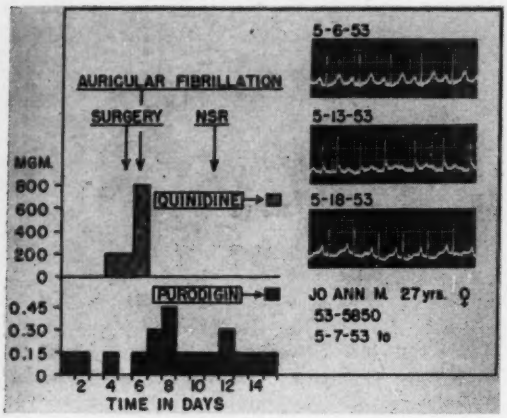

Figure 7.

Case 8, E. C., white female, age 53, KUMC No. 53-5829. Mitral stenosis and insufficiency, aortic stenosis, and minimal regurgitation. History of repeated emboli and paroxysmal nocturnal dyspnea. Mitral

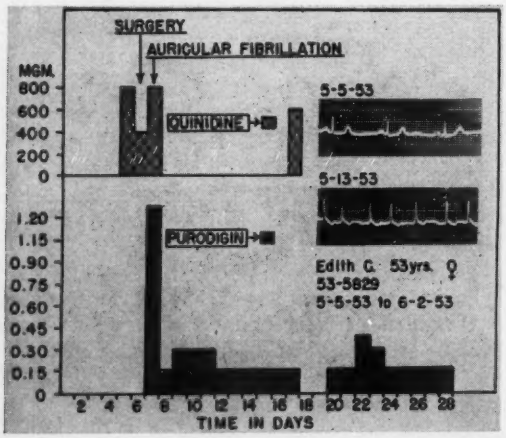

Figure 8.

commissurotomy was done on May 11, 1953, with repair of the valve; regurgitant jet disappeared after valvuloplasty. The next day the patient was found to be fibrillating. Because of nausea, quinidine was not given. One week later patient developed severe postoperative psychosis lasting almost three weeks. Because of this, attempt was made for conversion of auricular fibrillation at the time of this hospitalization. Histological pathology reported hypertrophy of the auricular appendage and mild chronic pericarditis.

DISCUSSION AND MANAGEMENT

Is there any risk in the occurrence of fibrillation in patients after mitral commissurotomy? A principal danger would seem to be the formation of a thrombus in the recently manipulated auricle and embolism. In this group of eight patients, no embolization was recognized clinically; no deaths occurred.

The sudden onset of auricular fibrillation in a patient recently operated upon is cause for considerable concern. The danger from thrombotic complications would seem to be considerably increased in these patients. The recent trauma to the auricle, the inevitable dehydration in a recently operated upon patient, the reduction in cardiac output, and the ineffective contractions of the auricle would set the stage for the serious thrombo-embolic disease. The reduction in cardiac output and possible pulmonary congestion may delay convalescence and favor pulmonary complications.

In these eight patients, a normal sinus rhythm was established in three with quinidine, in two with Pronestyl, and spontaneously in one. In the remaining two patients, our attempt at conversion was inadequate; either insufficient amounts of quinidine and Pronestyl were used or, as in Case 8, no attempt was made during hospitalization because of a severe postoperative psychosis.

SUMMARY OF THE EIGHT CASES (TABLE I)

Name	*Sex*	*Age*	*Development of Arrhyth.*	*Control of Arrhythmia*	*Activity Path.**	*Total Quinid.*	*Medication Prones.*
C.W.	F	34	2 days	P.O.	2 days	Yes	4.53 gm	No
M.K.	F	36	3 days	P.O.	No	No	0.53 gm	No
M.S.	F	41	1 day	P.O.	1 day	No	3.66 gm	22 gm
I.H.	F	41	1 day	P.O.	1 day	Yes	3.73 gm	No
G.L.	M	38	6 hours	P.O.	27 days	No	2.53 gm	41.75 gm
D.M.	M	28	9 days	P.O.	2 days	No	9.2 gm	No
J.M.	F	27	1 day	P.O.	7 days	No	+	—
E.C.	F	55	1 day	P.O.	No	No	—	—

* Evidence of activity as interpreted from the appendage by the pathologist.

The dose of quinidine and/or Pronestyl required for conversion is charted in Table 1.

The arrhythmia may be recurrent and persistent. For example, Case 3 relapsed into auricular fibrillation three times, and normal sinus rhythm was established three times before the normal rhythm could be maintained.

What is the cause of the arrhythmia? Various factors may be responsible. Of first importance may be the local trauma resulting from the manipulation of the auricle and from the sutures during the surgical procedure. The auricular appendage is clamped, slightly crushed by the Harken or Satinsky clamp, and purse string sutures are placed and rather vigorously pulled; the auricular appendage is amputated and tight sutures are placed. This manipulation is well tolerated, and serious arrhythmias are not common during this period. However, considerable edema and necrosis may occur in the postoperative period and may be responsible for the arrhythmia which we have observed.

A second cause to be considered is the possible reactivation of rheumatic activity in the amputated appendage.[2, 3] There was no correlation (Table 1). Three cases showed evidence of pathological activity; five did not.

The same lack of correlation frequently exists in regard to laboratory evidence of activity, including antistreptolysin titre, diphenylamine test, and heparin tolerance tests. The significance of the pathologist's finding of "activity" needs to be evaluated. Certainly there is little correlation between the pathologist's report and the clinician's observation. We have repeatedly and unsuccessfully attempted to correlate tests for rheumatic activity, pathological evidence of activity in the appendage, and the clinical course.

CONCLUSION

1. An unusual complication may occur in the postoperative period of mitral commissurotomy. In the immediate postoperative period, within the first week, auricular fibrillation may occur in patients who have previously had normal sinus rhythms. A normal sinus rhythm can usually be restored promptly.

2. In 28 patients undergoing mitral valvulotomy and with a normal sinus rhythm prior to operation, auricular fibrillation occurred in patients within the first week.

3. The auricular fibrillation was stopped successfully in six of the eight patients.

4. No correlation between occult activity in the amputated appendage and the occurrence of the arrhythmia was noted.

5. The arrhythmia may be associated with trauma and edema secondary to clamping, sutures, and amputation of the auricular appendage.

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Experimental Production of the "Dry Field" in The Right Auricle and Ventricle

C. S. Stotts, M.D., and Stanley R. Friesen, M.D.

Kansas City, Kansas

The field of cardiac surgery has expanded greatly in the past few years. Recently there has been much interest in the surgical repair of atrial septum defects. New avenues of approach to and methods of manipulation in the right auricle are constantly being discovered.[1] Hypothermia combined with ganglioplegic hypotensive anesthesia has made it possible to clamp the superior and inferior vena cavae of dogs for as long as 20 minutes without apparent damage.[1] With the use of the "atrial well," the surgeon can operate in the right auricle without haste.[2] The wall of the right auricle as well as separate sections of the wall are used as patches to occlude interatrial septal defects. Prostheses of plastic and polythene are sutured and clamped into positions occluding these septal defects.[3]

This paper is a preliminary report of investigations of methods of approach to the heart and intracardiac manipulation. Our prime goal in this series of experiments has been to develop a "dry field" method of intracardiac manipulation. The advantages of surgery done under direct vision, contrasted to that done through several centimeters of blood or by blind manipulation from the outside of the heart, are obvious. Clamping the superior vena cava, inferior vena cava, and the azygos vein will exclude all the incoming venous flow to the heart except the small coronary flow. When this has been done, the auricle can be opened, the remaining blood removed by suction, and an excellent view of the right auricle obtained. Also the right ventricle can be opened and explored under direct vision.

The authors had found by previous experimentation that five minutes occlusion of the cavae by such a method was the upper limit of safety. Andreasen and Watson have reported two series of dogs in which the vena cavae were clamped with the azygos ligated. They found their dogs died, starting at five minutes, and none survived over eight minutes. In a second series of 13 dogs, the clamps on the cavae were released after a five-minute period of occlusion. Five dogs lived without sequelae; five dogs died, and

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the remaining three dogs had severe neurological disturbances.[4]

Cohen, Hammerstrom, Spellman, Varco,[5] and Lillehei have completely occluded the caval circulation in a series of dogs for periods of three, four, five, six, and seven minutes. There was no immediate mortality or morbidity in the three-and four-minute series. One dog out of five in the five-minute class developed spasticity, blindness, and nystagmus.[5]

Bigelow and others have used hypothermia to reduce oxygen consumption, cardiac output, blood pressure, and heart rate. It has been found possible to completely exclude the heart from the circulation at 20°C. for as much as 15 minutes with survival.[6]

To investigate practical limits of "dry field" procedure the authors tested it on dogs. Intravenous nembutal with endotracheal positive pressure oxygen anesthesia was used. A right thoracotomy was performed through the fifth interspace. The azygos was ligated with silk just distal to its junction with the right auricle. The superior and inferior vena cavae were carefully isolated just distal to the junction with the right auricle, and lengths of umbilical tape were placed about them. These tapes were used to occlude the vessels with the aid of a hemostat clamped to the snugged up tape. The pericardium was opened, exposing the right auricle and ventricle. Stay sutures of silk were placed in the auricular wall. At this time the vena cavae were occluded and the auricle incised between the stay sutures. This exposed the right auricle and its communicating passages. The use of suction was occasionally necessary to maintain a completely dry field. To close the auricle the stay sutures were used to approximate the incision, and a Satinski clamp was applied to the incision. The tapes were then released.

Ten dogs were operated upon with the above technique. The time limit for occluding both the superior and inferior vena cava was one and one-half minutes. This occlusion was repeated 10 times in each dog, giving a total time for intracardiac manipulation of 15 minutes. All dogs survived, and in none was there any pathological sequelae other than that normally following thoracotomy in dogs. These dogs have been observed postoperatively for as long as seven months.

Elective autopsies of several dogs for the purpose of determining any possible local cardiac effects have shown only chronic adhesive pericarditis at the site of cardiac incision, and complete occlusion of the azygos vein without dilatation. The endothelial surface of the auricle at the site of incision showed no thrombus formation. The intimal linings of the superior and inferior vena cava at the sites of occlusion were without evidence of damage. In none of the lungs or coronary arteries was there evidence of air embolism.

DISCUSSION

The use of the caval occlusion method has been an aid to the authors in other lines of experimental cardiac surgery. The blind production of interatrial and interventricular septum defects is frequently unsatisfactory and unsuccessful. When such defects are produced in the "dry field," a much better result is accomplished.

Use of the "dry field" allowed the authors to suture atrial septal defects under direct vision. In this maneuver the blood from the left side of the heart was occluded by external finger pressure on the posterior wall of the left auricle.

The action of the tricuspid and pulmonary valves has been observed under direct vision after opening the right ventricle.

CONCLUSION

In this series of experiments it has been demonstrated that in the dog the right heart can be opened, examined and intracardiac manipulation carried out in a "dry field." These procedures are done safely by clamping the superior and inferior vena cavae for periods up to one and one-half minutes, releasing the occlusion of the vessels, and waiting until the heart resumes normal rhythm and rate. The process is then repeated. This has been done 10 consecutive times on each of 10 dogs. The azygos vein was permanently ligated in all dogs. None of the dogs died or developed sequelae. It is felt that this maneuver may be of value in cardiac surgery on human beings.

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Twenty thousand years ago the family was the social unit. Now the social unit has become the world, in which it may truthfully be said that each person's welfare affects that of every other.

—Arthur H. Compton

The Low Salt Syndrome in Children during Hot Weather

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The occurrence of the low salt syndrome as a result of excess sweating and low intake of sodium chloride in hot summer months is not uncommon in children. Very little recognition has been given to this syndrome in children in the literature and none at all in the pediatric textbooks. The clinical diagnosis is often difficult and sometimes missed—with disastrous results. It is important that physicians be familiar with this syndrome, since treatment is highly effective if instituted properly. It is on this account that the following three cases admitted to the K.U. Medical Center this past summer are being reported.

Case 1, D. J., a 14-month-old male, was admitted to KUMC on June 16, 1953, on the neurosurgical service with the chief complaints of drowsiness and lethargy. Two days prior to admission, the child was thrown against the dashboard of the family car; there was no loss of consciousness, but within two hours the child became unusually sleepy. For the 24 hours immediately prior to hospitalization, the child never roused fully, though there was tossing about and willingness to drink water. In this period he was admitted to a local hospital, where he was noted to be anuric and where he was given parenteral fluids. He was transferred to KUMC with the presumed diagnosis of head injury.

His past history was in no way unusual. Physical examination on admission disclosed a well nourished and developed child who appeared adequately hydrated. He tossed about when stimulated, but apparently was unconscious. Positive findings included a bruise on the forehead, large pupils which responded only negligibly to light, equivocal nuchal rigidity, a liver palpable 2½ cm. below the right costal margin, and bilateral Babinski reflexes. The child was afebrile; the pulse rate was 96, and respirations were 18 per minute. Hemoglobin on admission was 12.6 gms. per cent; the total white blood cell count was 5600, of which 60 per cent were polymorphonuclear leucocytes.

This child was treated as a surgical emergency. Prior to surgery, a cutdown on an ankle vein was done; during this procedure the child did become conscious and talked coherently. At surgery, bilateral temporal burr holes were made; no hemorrhage was encountered. Following the operation, the child did not regain consciousness.

The next morning tightness and isolated twitching of the extremities were noted, followed by a convulsion lasting 3 to 4 minutes. He was put in an oxygen tent. Chloral hydrate (grains five) was given rectally. No further convulsions occurred, but the extremities remained tight. The patient then vomited coffee ground material, which was positive to benzedine. Wangensteen suction was started.

Blood sugar was 99 mgm. per cent; CO_2 content of the blood was 25.5 mEq./L. Lumbar puncture revealed 8 white blood cells per cubic mm. in the spinal fluid. The sugar concentration in the spinal fluid was 111 mgm. per cent. The concentration of Cl in the spinal fluid was 450 mgm. per cent. This was the first indication of the real diagnosis of the child's illness.

From the Department of Pediatrics, University of Kansas School of Medicine.

TABLE I

Date	*Solution*	*Route of Adm.*	*Total Vol.*	*Total Salt*
6/16	5% glucose in water	i.v.	200 cc.	0
6/17	5% glucose in water	i.v.	500 cc.	0
	5% glucose in ½ normal saline with 8 mEq. KCl	i.v.	500 cc.	2.2
	plasma	i.v.	250 cc.	1.8
6/18	2½% saline	i.v.	100 cc.	2.5
	whole blood	i.v.	250 cc.	1.8
	2½% saline	i.v.	200 cc.	5.0
6/19	5% glucose in water with 8 mEq. KCl	i.v.	500 cc.	0
	2½% saline	i.v.	200 cc.	5.0
	5% glucose in water with 8 mEq. KCl	i.v.	500 cc.	0
TOTAL			3200 cc.	18.3 gms.

WEATHER BUREAU DATA

Day	*Maximum Temperature*	*Minimum Temperature*	*Max. Humidity*	*Min. Humidity*
6/14/53	94°	74°	88%	41%
6/15/53	102°	74°	85%	33%
6/16/53	88°	69°	82%	42%

(Weather Bureau readings were made at Municipal Airport, Kansas City, Missouri).

Because of continued stiffness of the extremities, avertin per rectum (60 mg., later 40 mg. per kilogram) was given at 4- to 8-hour intervals through the second hospital evening and night. On June 18 the concentration of Na and Cl in the blood was 117 and 76 mEq./L., respectively. Because of the low chloride, a total of 18.3 gms. of NaCl in various solutions was given from June 17 to June 19, with distribution of fluids as indicated in Table I. Within 24 hours of the institution of massive salt therapy, this child was up and about, alert, taking food well, and free from abnormal neurological signs. There was nothing in the child's history that would point toward fibrocystic disease. Recent correspondence with his mother indicates that he is growing well, is active and vigorous, and is without pulmonary or gastrointestinal tract signs.

ill child, not comatose, with ashen color and cold extremities. Temperature was 99° F., respirations were 30 per minute, and the pulse rate was 120 per minute. Heart tones were poor. Breath sounds were distant over the entire chest. Ribs 10, 11, and 12 were absent on the right, the testes were not palpable, and there were bilateral inguinal herniae. Much fecal material was palpable in the abdomen. Admission laboratory work showed the hemoglobin to be 16.1 gms. per cent; white blood cell count was 17,400, of which 82 per cent were polymorphonuclear leucocytes; Na of the blood was 33 mEq./L.; K of the blood was 3.8 mEq./L.; blood CO_2 combining power was 35 mEq./L.; blood Cl was 62 mEq./L.

Intravenous fluids were begun immediately; a total of 1600 cc. was given in 10 hours. Distribution of fluids is indicated in Table II. Oxygen was admin-

TABLE II

Date	*Solution*	*Route of Adm.*	*Total Vol.*	*Total Salt*
6/30	5% glucose in water	i.v.	100 cc.	0
	plasma	i.v.	150 cc.	1.05
	whole blood	i.v.	150 cc.	1.05
	5% glucose in normal saline with 10 mEq. KCl	i.v.	500 cc.	4.5
	5% glucose in water with 10 mEq. KCl	i.v.	450 cc.	0
	5% glucose in normal saline	i.v.	250 cc.	2.25
TOTAL			1600 cc.	8.85 gms.

Case 2, D. D., a 3½-year-old male, was admitted on June 30, 1953, with the chief complaints of anorexia for two days and vomiting for one day. He had fibrocystic disease of the pancreas which had been managed with the aid of terramycin, aerosols, fat-poor diet, vitamins, pancreatin, and residence in Arizona in winter and Canada in summer. At the time of this child's present illness, the family was en route by automobile from Arizona to Canada. Family history was significant in that one sibling died with fibrocystic disease at the age of three years.

Physical examination revealed a thin, chronically

istered intermittently by mask and tent. Within eight hours after admission, the patient was taking oral fluids without difficulty, and the day following admission the boy was up, active, and taking regular diet.

Case 3, R. G., a 14-month-old female, was admitted to KUMC on August 2, 1953, with the chief complaint of "being cold and blue." This child was said to have been in good health until the day prior to admission, when she became clammy, anoretic and thirsty. On the morning of admission she was taken to a physician who is said to have told the parents that the child had heat stroke, but prescribed no

WEATHER BUREAU DATA

Day	*Maximum Temperature*	*Minimum Temperature*	*Max. Humidity*	*Min. Humidity*
6/28/53	83°	71°	92%	60%
6/29/53	95°	74°	94%	40%
6/30/53	92°	77°	77%	40%

(Weather Bureau readings were made at Municipal Airport, Kansas City, Missouri).

medication. Later in the day she was taken riding by her parents and to a park to play. At this time she was noted to be lethargic. In mid-afternoon she began vomiting phlegm and lost consciousness for a few minutes. She was taken immediately to a local hospital where a complete blood count was done, revealing a high white blood cell count. The parents were told the child might have leukemia, and immediate admission to KUMC was arranged.

On admission no history of recent exposure to infectious diseases or intoxicants could be elicited. There was a history of an illness diagnosed as "asthma," present from birth to 10 months, with no subsequent difficulty. The mother reported that the child had many loose stools if she took freely of usual table foods.

On examination the child was well nourished, well developed, listless, and acutely ill. Her skin was cold and clammy. Peripheral pulses were absent; the anterior fontanelle was depressed; the neck was supple. There was no adenopathy. The chest was clear to percussion and auscultation. The heart rate was regular; heart tones were poor; there were no murmurs. The abdomen was soft, non-tender, and no masses were palpable. The deep reflexes were equal and hypoactive. The child's pulse was 140 per minute, blood pressure was 40/0, respirations were 45 per minute, and temperature was 99.8° F. Admission laboratory work disclosed a hemoglobin of 14 gms. per cent, a white blood cell count of 24,800, of which 72 per cent were polymorphonuclear leucocytes; the CO_2 content of blood was 13.5 mEq./L.

Intravenous fluids were started immediately with distribution as indicated in Table III. Penicillin and streptomycin were started intramuscularly. During the first six hospital hours, the child could be roused and drank freely of a mixture of Darrow's solution and glucose in water. About six hours after admission the child convulsed briefly. Calcium gluconate intravenously was given. The child was placed in an oxygen tent. The patient had been anuric since admission; she was catheterized, but no urine was obtained. Following the convulsion, the child's temperature rose to 103.2° F. and remained at high levels in spite of antipyretic measures for the remaining hours of her life.

In her final 12 hours, the child became opisthotonic with marked rigidity of extremities. Intramuscular phenobarbital was ineffective in relieving the rigidity; rectal avertin was used with satisfactory relaxation of the patient. Terminally there was considerable difficulty with the airway. The child vomited coffee ground material, and frequent suctioning was necessary. Eighteen hours after admission the child expired. She had been anuric from admission even though 1500 cc. of fluids had been given orally and intravenously. It was the clinical impression that she had developed lower nephron nephrosis. It was for this reason that salt-containing fluids were not given in greater amounts. Blood drawn three hours before death revealed NPN of 113 mgm. per cent; Na, 119 mEq./L.; Cl, 66 mEq./L.; K, 6.8 mEq./L. Blood culture was negative at 10 days.

TABLE III

Date	*Solution*	*Route of Adm.*	*Total Vol.*	*Total Salt*
8/2/53	2:1 5% glucose in water Darrow's solution	oral	500 cc.	1.19
	plasma	i.v.	50 cc.	.04
	whole blood	i.v.	200 cc.	1.4
8/3/53	5% glucose in water	i.v.	250 cc.	0
	5% glucose in normal saline	i.v.	250 cc.	2.25
	plasma	i.v.	250 cc.	1.75
TOTAL			1500 cc.	6.63 gms.

Autopsy revealed fibrocystic disease of the pancreas; there was no evidence of lower nephron nephrosis. In the absence of demonstrable kidney lesion, the anuria must be assumed to have been the result of markedly lowered blood volume.

DISCUSSION

The low salt syndrome, as seen in the cases presented here, is the direct result of losses of water and sodium chloride by sweating and of inadequate replacement of these salt losses. Parents are not alert

WEATHER BUREAU DATA

Day	*Maximum Temperature*	*Minimum Temperature*	*Max. Humidity*	*Min. Humidity*
7/31/53	100°	80°	68%	30%
8/1/53	100°	81°	72%	31%
8/2/53	100°	79°	72%	29%

(Weather Bureau readings were made at Municipal Airport, Kansas City, Missouri).

to the degree of their children's sweating, and the need for extra sodium chloride during hot weather is not universally recognized. In hot weather children are driven by thirst to replace their water losses, but, unless there is attention to their need for salt, the fluids used for replacement are likely to be electrolyte-poor. This loss is enhanced by the child's frequent refusal of solids during periods of heat.

That sweat does contain electrolytes sufficient to deplete the extra-cellular fluid if not replaced has been shown by numerous studies. One of the more recent of these was reported by Ladell in 1949;[1] he exercised 31 young, healthy adults in high external temperatures, while keeping careful salt and water balances. As would be expected, he found marked differences among his subjects in their tolerance for the testing situation. Reactions anywhere from "no change" to "fatigue," "edema," "thirst," "marked cramps," and "grey vision" were reported. Subjective symptoms were never observed when blood chlorides were normal. Intracellular overhydration, brought about by ingestion of salt-free fluids during the testing period, markedly increased the subjective symptoms. This obviously is comparable to the child's drinking large quantities of water without adequate salt intake.

In very young children, losses of electrolytes in sweat have been quantitatively determined by Cooke, Pratt and Darrow.[2] These investigators studied four infants kept on metabolic mattresses with analyses of their urine, stools, regurgitated material, and body washings for sodium, potassium, and chloride. This study was carried out with environmental temperatures at 81 and 91° F. Infants' feedings were varied in their electrolyte contents. Hyperpyrexia was not observed at these temperatures. As might be expected, however, on increasing the environmental temperature to 91°, there was immediate increase in the evaporative water loss and in electrolyte loss by way of the skin with the onset of active sweating.

Di Sant'Agnese, Darling, Perera, and Shea reported a striking finding recently.[3] Two groups of individuals, one known to have fibrocystic disease of the pancreas and the other group ill with various other disorders, were subjected for 1 to 2 hours to room temperature of 32.2° C. with 50 per cent humidity. Sweat was collected from the abdominal skin in all cases. The mean volume of sweat was not significantly different in the two groups; markedly different, however, was the chloride content of the sweat. The control group's sweat contained 4-80 mEq./L. of chloride, while that of the group with fibrocystic disease of the pancreas contained 60-160 mEq./L. of chloride. This finding suggests that the results of heat stress in children with fibrocystic disease of the pancreas are much more devastating than in children not ill with this disease.

This is indeed the case. Kessler and Anderson[4] reported 12 cases of heat prostration in New York City during periods of heat in which temperatures ranged from 99 to 107° F. Seven of this group had fibrocystic disease; of the remaining four, three were convalescing satisfactorily from surgery of the gastrointestinal tract, one had cerebral hypoplasia, and one had a congenital cardiac anomaly with cyanosis. Three expired shortly after their admission to the hospital; nine recovered after administration of salt-containing parenteral fluids and antipyretic measures.

The serum chlorides reported in this group ranged from 59 to 81 mEq./L. It is of interest to note that in several instances white blood cell counts on the order of 12,000 to 15,000 were reported, in the absence of any signs of infection. In Case 3 of our series, an elevated white blood cell count was present and had been interpreted at another hospital as a sign of possible leukemia. We would speculate that the leukocytosis may reflect merely adrenocortical response to stress.

In our present series, one child was known to have fibrocystic disease of the pancreas prior to his illness with the low salt syndrome, one child had unsuspected fibrocystic disease of the pancreas found on autopsy, and one child apparently did not have this illness. Certainly every child who tolerates heat poorly should be studied carefully with the possibility of fibrocystic disease in mind, and all infants known to have fibrocystic disease of the pancreas should receive extra sodium chloride.

At the time we saw Case 1, we were unfamiliar with all the aspects of the low salt syndrome. The finding of the low blood chloride was unexpected. We were aware that children in hot weather sweat, are anoretic, have low grade fevers (as reported by Cardullo, 1949),[5] vomit, and are sometimes lethargic. The findings of extreme lethargy deepening into coma, with abnormal neurological signs, opisthotonos, and convulsions are less frequently seen. The low salt syndrome must be included in the differential diagnosis of a child who is lethargic, stuporous, or comatose during periods of hot weather. The determination of the blood chloride is relatively simple, and the correction of this condition can be carried out quickly and easily, unless, as pointed out by Halley,[6] irreversible damage, particularly to the kidney, has already occurred.

As in any other illness, prophylaxis is the best therapy. Friedfeld,[7] among aged patients, helps individuals meet heat stresses by dispensing salt-rich solutions, and daily "heat rounds" in which amounts of sweating and slight temperature variations are noted, with prompt removal of individuals suspected of early heat reactions to cooler environmental temperatures. Cardullo[5] reports similar measures in hos-

pitalized infants in salting formulae and leaving infants unclothed.

It has become our custom to give hospitalized infants and young children mixtures of Darrow's solution and glucose water, instead of ordinary water, between feedings, and to give older children anywhere between 0.5 gm. and 1.5 gms. per day of salt in addition to their regular diet. In the case of children who are not hospitalized, parents should be instructed to encourage drinking fluids rich in electrolytes (or to administer salt tablets), particularly when children are eating poorly, and to watch carefully for excessive sweating or lethargy.

SUMMARY

Three cases of low salt syndrome have been presented. The etiology and symptomatology, with special reference to the correlation between the syndrome and the presence of fibrocystic disease of the pancreas, have been discussed. It is concluded that the low salt syndrome is not necessarily the inevitable consequence of excessive sweating, but rather, the inevitable consequence of indequate replacement of water and electrolyte losses through sweating. Failure to replace these losses is often due to failure to recognize the need for replacement.

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The Use of Trypsin in Rheumatoid Arthritis: A Clinical Study

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Innerfield, Angrist, and Schwarz[1] have reported marked clinical improvement in patients with rheumatoid arthritis following the intravenous administration of trypsin. When it was indicated[2] that the intramuscular route was probably as effective as the intravenous, a group of six patients with rheumatoid arthritis volunteered to submit to intramuscular administrations of trypsin in oil.

All patients presented evidence of rheumatoid arthritis according to the standards of the New York Rheumatism Association.[3] All presented moderate activity of the disease with no more than moderate x-ray evidence of joint damage, so that hope for definitive improvement was a legitimate possibility. All had been under observation by the authors for at least six months and had been stabilized during this period on a consistent medical program of analgesics, desoxycholic acid, vitamin D, other vitamins, and simple physical therapy. The medical program remained unaltered during the period of the study, with the exception of one case, other than by the administration of trypsin in oil injections. It was felt that the effects of the trypsin could best be evaluated if all other variables were as constant as possible.

The method of administration of the trypsin was the same in each instance: 2 mgms. were given intragluteally morning and evening the first day; 3 mgms. were given intramuscularly twice daily for the next five days. After the sixth day, the patients were reevaluated. Treatment was then resumed in larger dosage on alternate days for the following three weeks. The first two doses at the 48-hour interval were 10 mgms. each; since this increased dosage produced severe local pain without evidence of commensurate improvement in the arthritic symptoms, the individual dosage was reduced to 5 mgms. for the remaining two and one-half weeks of treatment. Complete blood counts were made, including differentials and platelets, and other laboratory studies were erythrocyte sedimentation rate, cephalin flocculation test, and complete urinalysis. These laboratory determinations were made just prior to, at

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The trypsin in oil was obtained from the National Drug Company (Parenzyme in oil, 2 mgms. trypsin in 1 cc. of sesame oil).

the end of the first week of, and at the conclusion of the four-week treatment period.

RESULTS

Each of the patients commented on an increased sense of well being during the first week of treatment. At the conclusion of the treatment period, only one patient felt that this had continued. Similarly, there were minor improvements in joint mobility and reductions in pain during the first week of treatment, but the objective improvement at the end of the period was negligible except in this single case. This exceptional patient enjoyed mild progressive improvement in pain, strength, and mobility which has continued during a six-month post-treatment period; in contrast to the other patients, he received phenylbutazone, 100 mgms. twice daily, as a part of his medical program.

One patient misunderstood her instruction, as was learned subsequently, and discontinued all other treatment during the experimental period. Even while receiving trypsin on alternate days, she developed acute and virtually incapacitating recrudescence of heat, pain, swelling, and stiffness in her knees and wrists. These symptoms promptly subsided when her previous treatment was resumed.

In three patients there was no significant change in the red blood cell count. In two patients there was a fall in hemoglobin value of 6 to 8 per cent. The sixth patient developed a transient painless hematuria four days after the conclusion of the study, and the hemoglobin value fell from 64 per cent to 38 per cent; no explanation for this phenomenon was discovered, although he was hospitalized and examined carefully from the urologic standpoint. There were no consistent alterations in the blood sedimentation rates, which were all high. The white blood cell count in one patient fell from 4,000 per cubic millimeter before treatment to 1,600 at the end of the first week, but rose to 3,400 as treatment was continued. The cephalin flocculation test ranged from 2+ to 4+ at the beginning of treatment in three patients; at the end of one week in the same patients a normal 2+ and 1+ value was reported.

CONCLUSIONS

1. Six patients with typical rheumatoid arthritis were given trypsin in oil intramuscularly over a four-week period.

2. In five of the six patients, aside from a temporarily increased sense of well being during the first week of treatment, no subjective or objective signs of improvement were noted. The sixth patient enjoyed steady improvement during and subsequent to the treatment period; phenylbutazone was included in his medical program.

3. The development of transitory leucopenia in one case and severe anemia with hematuria in another, shortly after treatment was discontinued, suggest that the administration of trypsin should be carried out only when careful supervision is possible.

4. Trypsin in oil administered intramuscularly under the circumstances outlined does not appear to be useful in the treatment of rheumatoid arthritis.

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IN FUTURE ISSUES OF THE JOURNAL

Two scientific papers scheduled for publication in this issue of the JOURNAL were omitted because of lack of space. They will be published later. The papers are:

Complete Heart Block With Morgagni-Adams-Stokes Syncope Treated with Large Doses of Epinephrine: A Case Report—William E. Larsen, M.D., Departments of Medicine, Veterans Administration Hospital, Kansas City, Missouri, and University of Kansas Medical Center, Kansas City, Kansas.

Report on the Tubeless Gastric Analysis—R. L. Van Citters, M.D., and Mahlon Delp, M.D., Department of Medicine, University of Kansas School of Medicine.

A Twenty-Four-Year Review of Cesarean Sections at Kansas University Hospitals

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The rising incidence of cesarean sections in most areas of our country is well recognized. In view of this, it was thought there might be some value in evaluating our own cases. In the United States today, 1.5 to 2 per cent of all pregnant women will be delivered by cesarean section.[1, 2] Every year the obstetrical journals publish papers comparing present statistics with previous results. Many articles justify the increase in incidence of cesarean sections on the basis of broadening the indications for this type of delivery.[3, 6] This broadening of indications, however, has been accompanied by the elimination of a few indications that are no longer tenable with our present knowledge of medical practice.

There are a number of large series of cesarean sections in recent literature which report little or no mortality and a significant increase in fetal salvage. This can be attributed to increasing use of antibiotics, the availability of blood banks, better anesthesia, and many other factors, all of which have resulted in a liberalization of the indications for cesarean section.

D'Esopo[3] has shown that abdominal section is slowly replacing the formidable midforceps delivery, and he feels an incidence rate of approximately 6 per cent cesarean sections should be adequate to eliminate the trauma, both maternal and fetal, caused by difficult vaginal operations. There seems to be general agreement that increasing use of abdominal delivery in many obstetrical problems is indicated, but that over-utilization of the operation is still a problem. Maternal mortality for abdominal delivery continues to carry 10 times the mortality of vaginal delivery.

Material: This review includes 471 consecutive cesarean sections among 15,871 deliveries done between September 1929 and September 1953. All operations were performed either by a member of the obstetric staff or by obstetric residents under supervision. The majority of patients received adequate prenatal care, although there were many exceptions among clinical or ward-type patients. The ward service is considerably larger than the private services.

Incidence: Figure 1 shows the incidence for five-year periods, which affords a better indication of the true incidence due to the larger number of considered cases. One can readily note that there has been a significantly increasing trend only in the post-war period. The last period, although short of five years, would indicate our approximate present rate of cesarean sections to be 4 per cent. It would appear that the greatest increase in incidence has occurred in the last time period, which is only 44 months and shows a 1 per cent increase over the previous five-year period and approximately 1.5 per cent increase over the 20 years preceding 1950. The incidence rate for the entire series was 2.9 per cent. We feel the trend to an increased incidence seen here is entirely justifiable and perhaps has played some role in the increased fetal salvage at this institution.

FIGURE 1

INCIDENCE OF CESAREAN SECTIONS FOR FIVE-YEAR PERIODS

	Deliveries	*C.S.*	*Per Cent*
1930-1934*	1595	27	1.7
1935-1939	2006	54	2.2
1940-1944	2777	67	2.4
1945-1949	4454	127	2.9
1950-1953**	5039	196	3.9
TOTAL	15,871	471	2.9

* Includes the last four months in 1929
** Includes the first eight months only of 1953

Parity: The parity of these patients is recorded in Figure 2. Approximately one-third of the patients were in their first pregnancy, and nearly two-fifths were having their first delivery. There was one patient who had had 13 previous children.

FIGURE 2

	Parity	
Total	471	100%
Primipara	151	32.1%
Multipara	320	67.9%

PREVIOUS DELIVERIES

Number of Deliveries	*Number of Patients*	*Per Cent*
None	181	38.4
One	139	29.5
Two	70	14.9
Three	33	7.0
Four	19	4.0
Five	8	1.7
Six	4	0.8
Seven	7	1.5
Eight to Thirteen	12	2.5

Labor and Membranes: Data concerning labor and

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membranes is presented in Figure 3. Labor was present in some degree in 16.4 per cent of the patients. Up to recent years, approximately 95 per cent of our abdominal deliveries were elective. These figures reflect an increasing use of trial of labor in many patients these last several years, patients who would have previously had elective sections.

FIGURE 3
LABOR AND MEMBRANES

	Number	*Per Cent*
Labor:		
No labor	394	83.6
Less than 6 hours	21	4.5
6 to 11 hours	10	2.1
12 to 17 hours	13	2.7
18 to 23 hours	7	1.5
24 to 29 hours	5	1.0
30 to 36 hours	7	1.5
36 to 48 hours	5	1.0
48 hours and over	7	1.5
Membranes:		
Intact	413	87.7
Ruptured:		
5 hours or less	20	4.2
6 to 9 hours	10	2.1
10 to 14 hours	3	0.6
15 to 19 hours	3	0.6
20 to 24 hours	0	0.0
25 to 29 hours	1	0.2
30 to 40 hours	8	1.7
40 hours and over	10	2.1
Unknown	3	0.6

The membranes were ruptured for varying lengths of time before surgery in 12.3 per cent of all cases. There were 10 patients with ruptured membranes for 40 hours or more, and in a few of these it was for several days.

Indications: In tabulating the indications for cesarean section, the primary indications (Figure 5) were separated from those that seemed to be secondary. Those considered as primary were any indications that would necessitate in themselves a cesarean section, and the secondary indications were those that would not, except in combination with other indications, invoke the necessity of a cesarean section. We believe this has made the following tables more meaningful.

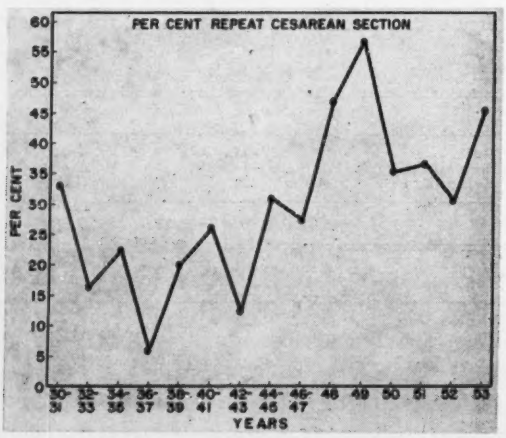

FIGURE 4

Repeat cesarean section was a primary indication in 32.3 per cent of our patients. Figure 4 is a graph illustrating the somewhat erratic but definite upward trend in the number of repeat sections. In 1949 they composed over 50 per cent of the sections done that year. At no time in recent years have they been less than 30 per cent. They now compose nearly 40 per cent of all sections.

How many of these repeat cases could have been considered eligible for a subsequent vaginal delivery? There were 83 of the 152 patients in whom the primary reason for their first cesarean section did not exist at the time of their subsequent deliveries. Of the 471 cesarean sections in this series, 9 known patients have subsequently delivered 11 times vaginally, including one set of twins. This is not a true picture in that many of the recent sections were in patients who have not had adequate time for subsequent pregnancies, and an unknown number of patients have had subsequent deliveries elsewhere. This indicates that in this center we do not adhere closely to the dictum, "Once a cesarean section, always a section." The New York Lying-In Hospital and the Margaret Hague Maternity Hospital[8] have reported that 38.7 and 35.8 per cent, respectively, of their women with previous sections are delivered vaginally. Although we are more willing to give these patients a trial of labor now than previously, we have not reached the point of letting the majority of these patients with previous sections labor as a trial.

FIGURE 5
PRIMARY INDICATIONS FOR CESAREAN SECTION

Indications	*Occurrence*	*Per Cent*
I Repeat cesarean sections	152	32.3
II Cephalopelvic disproportion	156	33.1
III Other pelvic obstructions	44	9.3
IV Toxemias	47	9.9
V Hemorrhage	60	12.7
VI Firm cervix or cervical dystocia	38	8.1
VII Thin uterine scar diagnosed clinically	20	4.2
VIII Myomectomy previously	5	1.0
IX Diseases	64	13.6
X Abnormal presentation	7	1.5
XI Miscellaneous	30	6.4

A slightly larger but approximately equal group in actual numbers to the repeat section group is the cephalopelvic disproportion patients. There were 72 of the 156 patients with small measurements of outlet or midpelvis, 15 with small inlet measurements, and 45 with a generally contracted pelvis. All of these patients, with only rare exceptions, had x-ray pelvimetry. There were an additional 8 patients with pelvic deformities due to fracture, disease, or unknown causes. The monsters, two hydrocephalic, and two of other types were also placed in this disproportion group.

In the third group labeled as "other pelvic obstructions" were 9 patients with obstructive fibroids, 3 with ovarian masses, and 12 with old third degree lacerations of the perineum. There were an additional 20 patients with cervical carcinoma or previous cervical operations.

Severe toxemia was the primary indication for abdominal delivery in nearly 10 per cent of the 471 patients. Three of the 47 patients had eclampsia. Only those patients with toxemia who were not responding to conservative management and in whom induction of labor seemed out of the question received a cesarean section.

Among the hemorrhage patients were 18 with central and 21 with marginal placenta previa. The 20 patients who were delivered by section for premature placental separation represent a rather small minority in comparison with the vaginally delivered patients with this complication.

In this institution we have recognized the so-called "firm cervix" for many years, but only recently have we become fully aware of its significance in regard to fetal mortality. It has caused more fetal deaths than placenta previa in this hospital. The statistics and importance of this usually unrecognized entity will be published later this year by Dr. Calkins.

We now have the opinion that cesarean section is indicated with these conditions: (1) a firm cervix which does not soften as labor progresses; (2) poor pains which show no tendency to improve as labor progresses; (3) persistently high station, and (4) if the first stage will obviously exceed 30 hours.

We feel it is necessary to see our patients early in labor and to follow them closely throughout their labor, which probably explains why we are impressed with this entity.

At surgery, 13 of the 20 patients with a clinical diagnosis of a thin uterine scar showed a very poor and thin scar which would not have tolerated labor. Three patients had intact scars with no defects. The condition of scar in 4 patients is unknown. However, there were 6 patients with poor scars and 4 with incomplete rupture of old scars that were not diagnosed clinically before surgery. It appears that our showing is no better than others in evaluating uterine scars. Most authors frankly state they are as frequently wrong as right in their diagnoses of weak uterine scars.

In the disease indication group, rheumatic heart disease was the primary indication in 26 patients. The majority of these cases occurred before the last 5 to 10 years. Only the most severe rheumatic heart disease patient would be sectioned in this clinic now. There were 13 severe diabetic patients delivered by the abdominal route. A number of these were severe juvenile-type diabetics, and some had poor obstetrical histories. No cesarean section for tuberculosis has been done in recent years.

The abnormal presentation cases were mostly transverse lies. Brow presentation was noted twice and twins once with both breeches lodged in the pelvis. These latter three cases were non-elective cesarean sections.

Those patients in the miscellaneous group were: psychiatric, 1; elderly primigravida, 2; poor obstetrical history, 8; premature rupture of membranes, 3; acute hydramnios, 3; fetal distress, 5; others, 8.

The secondary indications are listed in Figure 6. Those showing the most common occurrence were unfavorable cervix, abnormal presentation, and the miscellaneous group. Mild pre-eclampsia and poor obstetrical history were factors in 10 patients.

FIGURE 6
SECONDARY INDICATIONS FOR CESAREAN SECTION

Indications	*Occurrence*	*Per Cent*
I Cephalopelvic disproportion	6	1.3
II Other pelvic obstructions	1	0.2
III Mild pre-eclampsia	10	2.1
IV Unfavorable (unprepared) cervix	33	7.0
V Diseases	10	2.1
VI Abnormal presentation	16	3.4
VII Miscellaneous	32	6.8

Types of Operations: The types of cesarean section done are shown in Figure 7. It is not clear how some authors have counted their low segment procedure with a vertical incision, so these are listed separately. The high incidence of classical sections is in marked contrast to most reported series. At present we do many more Phaneuf (transverse cervical) sections than classical sections. Those patients having a hysterectomy total 4.4 per cent. The reasons given for those patients having a Porro were fibroids in 6 patients, a Couvelaire uterus that would not respond in 2, an abnormal uterus in 2, and thin old scars in 2. Uterine rupture, frozen pelvis due to acute myelogenous leukemia, Grade I carcinoma of cervix, previous cervical amputation, and one kidney were each listed as the reason in one case. Those patients having a total hysterectomy were listed as carcinoma of cervix Grade I, cervical fibroid, and previous cervical amputations.

FIGURE 7
TYPE OF CESAREAN SECTION

Type	*Patients*	*Per Cent*
Classical	344	73.0
Low segment, midline incision	52	11.0
Low segment, transverse incision (Phaneuf)	54	11.5
Porro	17	3.6
Total hysterectomy (Bishoff)	4	0.8

Anesthesia: The incidence and types of anesthesia are listed in Figure 8. Since no detailed study of

natal deaths was done, no attempt was made to determine the effect of different anesthetic agents and methods upon the mother, fetal resuscitation, or fetal mortality. The great majority of the spinal anesthetics were given in the last 5 or 6 years. Most of the local anesthetic cases were done in the past year. Previous to that time, most sections were done under general anesthesia of different types.

FIGURE 8
TYPE OF ANESTHESIA

Anesthesia	*Patients*	*Per Cent*
Spinal	203	43.1
Spinal with gas	19	4.0
Cyclopropane	111	23.6
Cyclopropane-Nitrous	11	2.3
Nitrous	39	8.3
Local	9	1.9
Other	56	11.9
Unknown	23	4.9

Transfusions: As a matter of interest, the number of transfusions that these patients received during their hospitalization was recorded. Two hundred ninety-two patients, or 62 per cent, received no transfusions. Those receiving only one transfusion constituted 22.7 per cent, and an additional 12.3 per cent received two or three transfusions.

Two patients received quite large amounts of blood. One was a 23-year-old colored primigravida who was admitted at 41 weeks gestation with a diagnosis of placenta previa. She was allowed to labor for one hour and was then sectioned. A uterine pack was used at surgery, but the patient continued to bleed excessively and it was necessary to do a total hysterectomy four hours later because of a hemorrhagic diathesis. Both mother and child lived. This patient received 15 pints of blood. The other patient was also a 23-year-old primigravida with a frozen pelvis from acute myelogenous leukemia. A Porro section was done at 34 weeks gestation because of a rapidly worsening course. She received a total of 17 pints of blood, three of which were given in the postoperative period. She expired on the second postoperative day.

FIGURE 9
POSTOPERATIVE MORBIDITY (100.4 Degrees)

*Days of Fever**	*Patients***	*Per Cent*
None	129	27.7
One	155	33.3
Two	71	15.2
Three or more	111	23.8

* Consecutive days of fever
** 466 patients

Morbidity: Figure 9 shows the incidence of postoperative morbidity. Slightly more than one-quarter of the patients had no morbidity. An additional one-third of the patients had only one day of fever, which in the majority of cases occurred on the first postoperative day. Reviewers of cesarean section cases consider patients having fever only on the first postoperative day as insignificant and do not record them in morbidity statistics. If we did, this 61 per cent of our patients had no morbidity. Another 15 per cent of the patients had only two days of fever. The more severe cases of morbidity total 23.8 per cent. In the last five-year period, only 18 per cent have had a fever of three or more days.

The bar graph of Figure 10 shows the marked change that has come about since the advent of use of antibiotics. We believe that the decreasing postoperative morbidity in the last 12 years can largely be accounted to better pre- and postoperative care

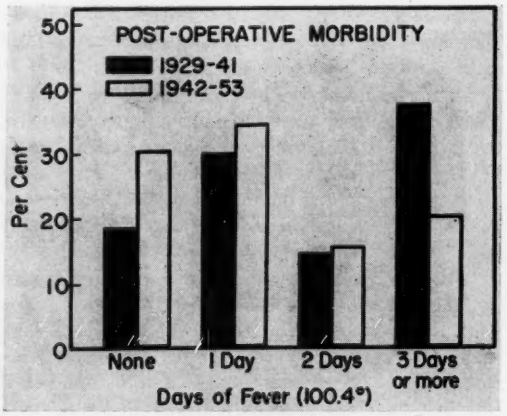

FIGURE 10

with fluid and electrolyte balance and the more prevalent use of transfusions and prophylactic antibiotics. The difference in the more severe morbidity column would probably more directly point to antibiotic usage, although many other factors would also have to be included. In comparing our incidence of morbidity of any two consecutive days after the first postoperative day, which is the way it is usually recorded, with previous reports, we seem to have an unusually high incidence. If only the last five years (which are not shown in figures) are considered with those from other hospitals covering roughly the same period, we have the following: Jones[9] reported an unusually low rate of 15 per cent from the Charlotte Memorial Hospital, Charlotte, N. C. Northwestern University Hospitals[10] reported 22 per cent. Our incidence is 34.6 per cent. No statistical correlation could be found in this small series between degree of morbidity and the duration of ruptured membranes.

Complications: Postoperative complications are listed in Figure 11. Stastically, only two are of real importance. The first is all cases of morbidity in

which no clinical diagnoses could be made. The second is urinary tract infections. It is gratifying to note that in the past five years the percentage of patients with no postoperative complications is approaching twice the figure that our series showed in the first 12 years. It also appears that we are improving our ability to diagnose the cause of morbidity more prominently in the last 12 years than in the first 12 years of this review.

FIGURE 11
POSTOPERATIVE COMPLICATIONS

Complication	*1929*-1941*	*1942-1947*	*1948-1953*
None	16.3%	23.8%	27.2%
Morbidity, cause unknown	43.3	23.8	23.0
Urinary tract infection	8.7	29.5	31.9
Others	31.7	22.9	18.0

Others Include:	*Patients*	*Per Cent*
Wound infection	9	1.9
Wound dehiscence	5	1.1
Pneumonia	17	3.6
Upper respiratory infection	8	1.7
Paralytic ileus	13	2.8
Endometritis	8	1.7
Atelectasis	9	1.9
Others	56	11.9

* From September 1, 1929 to January 1, 1941.

Fetal Mortality: The graph in Figure 12 shows the cesarean section and fetal mortality incidence with gestation. The greatest percentage-wise loss was in the most premature babies, as expected. The critical weight for the premature infants in this series was somewhere between 1750 and 2000 grams. The 3000 to 3250 gram group showed the best survival rate in this series. There appears to be an increase in fetal loss in larger babies, but the small numbers involved reduce the significance of this observation. Fetal mortality is practically zero at 38 weeks, after which time it again shows a progressive rise up to 41 weeks gestation. The large majority of these mothers had

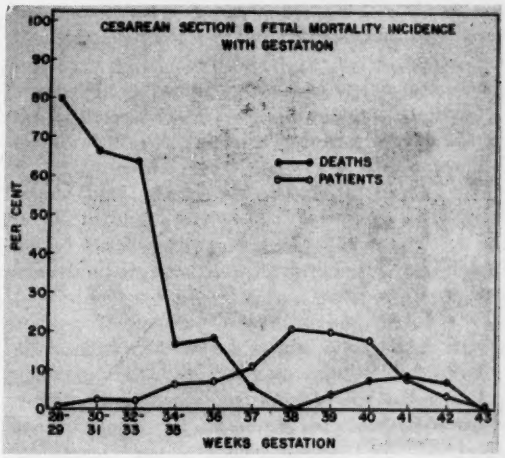

FIGURE 12

their abdominal deliveries between the 37th and 40th weeks.

It would appear from this graph that the babies in our series had their best chance for survival at the 38th week. This statement has been made many times previously in the literature. For diabetic mothers an even earlier date seems most advisable. Omitting the congenital anomalies incompatible with life, our current rate of fetal loss is 7.2 per cent.

Maternal Mortality: The corrected maternal mortal-

FIGURE 13
MATERNAL MORTALITY CASES

Case	*Year*	*Age*	*Parity*	*Indication*	*Cause of Death*
E.B.**	1931	24	0	Rheumatic heart disease with severe cardiac decompensation	Cardiac failure at onset of surgery
G.B.	1937	23	3	Fracture C_6 with only diaphragmatic breathing	Bronchiectasis, pneumonia, pulmonary edema, nephritis
E.L.**	1938	21	0	Severe pre-eclampsia with possible abruptio placenta	Acute peritonitis, hepatitis, toxic nephrosis
J.J.	1944	32	4	Comatose from subarachnoid hemorrhage	Thrombosis of choroid plexus with bilateral intraventricular hemorrhage
B.B.**	1947	34	0	Prolonged labor without progress with firm cervix	Wound dehiscence 9th p.o. day. Died 13th p.o. day from perforation of cecum, acute peritonitis, hepatitis
M.J.**	1948	19	0	Fulminating pre-eclampsia	Eclampsia, pulmonary edema
E.J.	1950	23	0	Frozen pelvis from tumor	Acute myelogenous leukemia on 2nd p.o. day
R.U.	1950	29	0	Onset of labor following craniotomy for malignancy	Meningioma, died 9th p.o. day
M.M.	1951	23	2	Moribund patient	Acute bulbar poliomyelitis
V.S.**	1951	33	1	Prolonged labor with firm cervix & borderline pelvis	Respiratory paralysis from spinal anesthetic

** Considered avoidable deaths

ity incidence of this series of 471 patients is 1.06 per cent. The mortality cases are shown in Figure 13. The first patient (E. B.) was a grade IV cardiac patient in pulmonary edema with a blood pressure of 198/35. Section was done to save the baby, which was, however, a stillborn. Fetal heart tones were last heard two hours prior to surgery, but the mother's respirations obliterated the heart tones after this. This should probably be classified as an unavoidable death.

Cesarean section was done on the second patient for the baby which survived. The mother's death was imminent.

The third patient (E. L.) had a hard tetanic uterus, and abdominal delivery was decided upon for the possible abruptio placenta which was not found. The infant was a hydrocephalic and died the first day.

The fourth patient had a postmortem cesarean section, and a good baby that survived was obtained.

Good babies were obtained with the next four patients. The neurosurgical consultants insisted upon delivery by cesarean section in the eighth patient (R. U.).

The ninth patient (M. M.) had a temperature of 110 degrees, and the infant was nearly too hot to hold in the operator's hands. If surgery had been done four hours earlier, the infant might have lived.

The last patient's death (and fetal loss) was directly due to the anesthetist's carelessness. Cardiac massage was done immediately, but patient never responded.

SUMMARY

1. A 24-year review of 471 consecutive cesarean sections with an incidence rate of 2.9 per cent is presented.

2. In a clinic with a considerable amount of referred pathology, an incidence of four to five per cent is probably justified.

3. It is no longer necessary to do a high percentage of elective sections. Trial of labor can be utilized much more freely.

4. Repeat cesarean section need not be routine, particularly if the operating room and operating team are immediately available.

5. Low cervical (longitudinal incision) is often not feasible as an elective procedure.

6. Increasing use of local anesthesia is advisable. The anesthetist is, however, more important than the agent.

7. Abdominal delivery is still 10 times as dangerous (maternal mortality) as vaginal delivery.

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All the religious leaders, however far apart in time and place, and however impossible it was for them to communicate and compare their thoughts, have arrived at the conviction that there is a divine purpose in life. This conviction springs as naturally from a devout mind as an oak tree springs from an acorn. It is the result of the spontaneous flowering of human thought. The seed has an instinct to grow into a plant. And man has an instinct to blossom into faith. . . . He is born, as every religious teacher has observed, with an impulse to make himself useful to his fellow men.

—*Henry Thomas*

THE MONTH IN WASHINGTON

Editor's Note. The following summary of Washington news was prepared by the Washington office of the A.M.A. for distribution to state and regional medical journals.

Some parts of the Eisenhower administration's broad health program are making good progress on Capitol Hill, while others are virtually standing still or bogged down in the technical complications that are always a threat to new legislation. Well ahead of the other proposals, and possibly destined for enactment, are bills to broaden the scope of the Hill-Burton hospital construction law and to liberalize income tax deductions for medical expenses.

The House Interstate and Foreign Commerce Committee, under chairmanship of Rep. Charles Wolverton (R., N.J.), wound up its long fact-finding study of voluntary health insurance plans and immediately started hearings on the Hill-Burton changes. The purpose is to amend the Hill-Burton law so that it can be used to disburse federal grants to states for construction of health facilities that do not qualify as "hospitals." The administration is anxious to stimulate the building of more nursing homes, hospitals for the chronically ill, diagnostic or treat ment centers, and rehabilitation facilities.

An initial appropriation of $2 million would be authorized for surveys and planning, and $60 million annually for three years of construction. Per capita income as well as population would be used to determine a state's share, as under the present Hill-Burton program.

At the House hearing, crowded into two days, the construction program was endorsed at least in principle by every witness, except the representative of the American Association of Nursing Homes. Because the program is limited to non-profit sponsors, members of this group could not receive grants. Their spokesman said long-term loans through the Small Business Administration would help solve their problem.

The A.M.A. recommended passage of the bill, but urged that facilities for the chronically ill and the handicapped be "part of or near a conventional hospital," and that facilities of all types be open to the entire community without discrimination, as in the present Hill-Burton law. (It is likely hearings also will be held on this legislation in the Senate.)

The House Ways and Means Committee, meanwhile, was giving its approval to a new income tax provision that would allow the deduction of medical expenses if they exceed three per cent of adjusted gross income, rather than five per cent under present law. The present maximum limitation would be doubled, and the deduction of travel expenses allowed where travel is prescribed by a physician. These changes—a long-time A.M.A. goal—are embodied in the omnibus tax readjustment bill.

President Eisenhower's proposal for federal reinsurance of voluntary health plans has not been able to follow the steady course on which it first appeared to be embarked. At the House hearings, none of the spokesmen for the large organizations in the health fields—A.M.A., Blue Cross and Shield, American Hospital Association—was willing to endorse the plan. Like the A.M.A. spokesmen, most of them wanted first to examine the actual administration bill, which at that time had not been introduced. From the Blue Cross, however, came a suggestion that the idea be tried out experimentally.

Spokesmen for national labor organizations expressed mixed reactions, with some maintaining that reinsurance was a poor substitute for what they believe the country really needs—national compulsory health insurance.

The administration's health budget for the next fiscal year, starting July 1, calls for a slight overall reduction. The regular Hill-Burton program, currently operating on $65 million, would get $50 million (any appropriation to start the proposed expanded construction would be in addition). Relatively sharp reductions would be made in funds for venereal, tuberculosis, and communicable disease control, in line with the policy of shifting this responsibility to the states. The various research institutes would receive about what they are now spending.

One of the few new items is for $7.8 million, estimated as necessary for the extra cost of enlarging the federal program of vocational rehabilitation. Legislation authorizing the expansion is awaiting Congressional action. The administration hopes gradually to increase the number of persons rehabilitated annually from the current 60,000 to 200,000. While the program is being stepped up, one of its goals would be to induce states to increase their spending until eventually their appropriations match the federal. Like most of the President's health program, the rehabilitation effort has the support of the A.M.A.

Conferences between A.M.A. officials and administration leaders are continuing. Latest sessions were with Secretary Hobby, concerning her department's legislative plans; with VA Administrator H. V. Higley, on treatment of non-service connected cases; and with Admiral Arthur W. Radford, chairman of the Joint Chiefs of Staff, and Dr. Frank Berry, assistant defense secretary for health and medical matters.

PRESIDENT'S PAGE

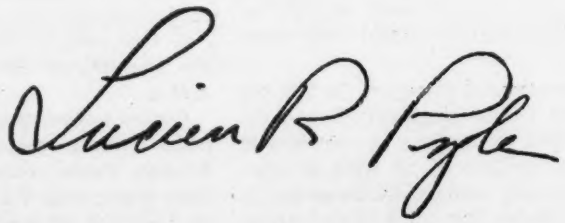
DEAR DOCTOR:

In March of 1947, the first University of Kansas School of Medicine issue of the JOURNAL OF THE KANSAS MEDICAL SOCIETY was published. The fact that each year since that time the Editorial Board and the Medical School have seen fit to continue with that issue speaks for itself.

All matters pertaining to education and advancement in our state should revolve around the hub of our schools and institutions of higher learning. In the case of medicine, that institution is the University of Kansas School of Medicine.

As the science of medicine becomes more detailed and complex, the University of Kansas School of Medicine becomes more essential to each and every one of us. It has met the challenge, not only by offering many courses for continued study at the school, but it has also sent the courses to us right in our own community, in the form of circuit courses. The popularity of this form of continued study in Kansas is attested by the fact that the University of Kansas School of Medicine ranked with the highest in enrollees for courses in postgraduate education last year.

No one can foresee the future, but we can envision the future in the light of past experiences. The sound building and planning of undergraduate and continued medical education, closer and more extensive co-operation of the medical profession with all phases of that educational program, will cause the School of Medicine to grow and prosper. Thus, it will more adequately serve its rightful place in ministering to the health needs of the people of Kansas.



EDITORIAL COMMENT

Eighth Annual K.U. Issue

This, the March 1954 issue of the JOURNAL, is the Eighth Annual University of Kansas School of Medicine Number. Members of the Editorial Board take pleasure in repeating this salute to our state medical school.

Although the JOURNAL seldom goes to press without including some contribution from the school, this issue includes scientific material from that source only. The work of assembling the material was done by Dr. Glen R. Shepherd, an associate editor of the JOURNAL who has ably served in that capacity in former years.

Progress at the Medical School

Editor's Note: The following editorial was prepared for the JOURNAL *by Dr. W. Clarke Wescoe, dean of the University of Kansas School of Medicine.*

One year ago I had the pleasure of writing a progress report on your school of medicine for our JOURNAL. Since that writing many things have happened and additional progress has been made. Therefore, rather than just write a word of welcome in connection with the appearance of this annual medical school issue, I have decided to bring the progress report up to date for you.

Legislative Action. When last I wrote, the legislature was meeting in biennial session and was considering the appropriation requests of the University of Kansas Medical Center. The full membership of the Ways and Means Committees of the House and the Senate visited with us and toured the center. The appropriations, as they were finally made, were generous to your school and made possible the operation of our facilities in the manner that you wanted them to be operated. It was most heartwarming to have the full support of the Society behind our requests, and I appreciate that it was this full support that in large measure impressed the members of the legislature with our need for increased appropriations.

For your help we are all most grateful, and for the forthright support of the legislature we are all most appreciative. This was a convincing demonstration that our state means to continue to operate a medical school that will be a front-runner. This demonstration, of course, maintains the enthusiasm of all of us at a high level.

Society Committee. While the legislature was in session the executive faculty had the pleasure of meeting twice with the Society's Committee on Medical Schools. Dr. Whitley and his group were the first such to visit the school in many years. They were given a complete survey of the operations of the medical center and a résumé of its problems and future plans. This year we will be meeting again at approximately the time you will be reading this report. One of the high spots of the last year for all of us was the warm vote of confidence extended to your medical school by this committee in its report that was accepted by acclamation by our House of Delegates.

Admission of Students. We have just concluded our screening of applicants for admission for this year's entering class and have accepted 100 students of the approximately 300 who applied. It became apparent when we visited with the medical school committee last year that many of you would like to know more about how the admissions committee makes its selections. In brief, we base our decisions upon these factors: previous scholastic attainment, results of the medical college admission test, results of personal interviews, and letters of recommendation.

We base a great deal of our decision on scholastic achievement because the records show that it is a rare individual, indeed, who serves with great distinction as a medical student after a low collegiate scholastic record. In cases of doubt, where scholastic achievement happens to be borderline, we place emphasis on the candidate's record in the medical college admissions test. If the record here is good, we are influenced in the candidate's direction.

The two areas of greatest difficulty are the interview and the letters of recommendation. Let me first say a word about the latter. We have a difficult time in obtaining what we consider to be thoughtful letters of recommendation. Unfortunately, the great majority of our letters are glowing and contain little solid comment. If each of our students were the paragon of virtue, honor, and intelligence that the letters indicate him to be, we would be teaching annually a new company of saints. Such unfortunately is not the case.

The personal interview is perhaps the one place where the unfortunate personality is revealed. Our interviewing technique is far from perfect, but we believe that interviews help us to screen out applicants unfitted emotionally or personality wise for the study of medicine.

We look upon our mission not as providing large numbers of doctors for Kansas but rather as providing the *best possible doctors* for Kansas. We are training those that we believe will be physicians whom you and we can accept proudly as members of our profession and to whom the patient will be able to go in confidence, confident of their knowledge and their integrity.

At the present time all of the medical schools in the United States are faced with a reduction in the number of qualified applicants. We are no exception. This lack of applicants is related to the low birth rate of the depression years. We are now at the nadir; in a few years the numbers will increase again, and we shall be faced with the necessity of turning down qualified applicants. At the present time we are encouraging young people to the study of medicine knowing full well that if their academic records are good and their personalities acceptable they will be able to gain admission easily.

Personnel. Since our last report we have added personnel in teaching positions in many of our departments. New teachers have joined us in the Departments of Psychiatry, Radiology, Medicine, Pediatrics, Surgery, Pharmacology, Pathology, and Obstetrics. Additionally, following the retirement of Miss Woodruff after long years of faithful service, we obtained the services of Mr. Cavanagh, our new librarian.

There are two new appointments of which I should like to make more than passing mention, not to slight the other excellent new people but to point up new developments. Last year, the Kansas Tuberculosis and Health Association endowed the Christmas Seal Chair of Thoracic Diseases for a five-year period. This endowment marked a significant advance for the association and for the medical school. From the standpoint of the association, it represented the affirmation of the fact that education is a prime mission of all health agencies. From our standpoint, it was most significant in that it is the first endowed chair in the medical school. We look to the day when there will be many more. Dr. Martin Fitzpatrick is the first appointee to this endowed chair.

In September of last year, Dr. Vernon Wilson joined us as Assistant Dean in Charge of Student Affairs. This most important position he has filled admirably. Student morale is at a high level, and this is in large measure a tribute to him. Our students are our greatest responsibility, and we mean them to have the finest of advice and counsel. This position will be a permanent and increasingly important one.

Physical Plant. We are now beginning to occupy fully the new building housing hospital services and the beds for chest diseases. For the first time we have an adequate obstetrical service geographically complete. Additionally, we have a completely equipped nursery for premature infants as well as a modern facility for the treatment of chest diseases. The new cafeteria is approaching completion, and we hope to occupy it within the next six weeks.

Of paramount importance to all of us is the Student Union-Continuation Study Center which is now almost completed. A director for the building has been employed, and we are looking forward to its early use. We have scheduled its dedication for April 4 and intend to open it then, despite the fact that we do not have funds sufficient to complete its furnishing.

You have been most generous in your response to our pleas for funds, and we are grateful to all of you who contributed so generously. This building represents a contribution of at least $50,000 from physician alumni of the university and members of the Society. Contributions this year to the American Medical Education Foundation have been the highest of any year to date. Your continuing support to this foundation is vital to us, and we are delighted to see contributions to it continually increasing.

Our psychiatry building is now in final drawing stage, and construction on it should begin before July. This represents the last building made available by the Rural Health Program passed by the legislature in 1949.

Postgraduate Courses. Postgraduate education, which has always been a co-operative venture between the Kansas Medical Society and the medical school, continues to be an ever-increasing program. We are proud of our position in the forefront of this field. Rather than hold the line we intend to enlarge this program and offer more courses for you. Your suggestions along this line continue to be most helpful, and we solicit them.

Need for Library Unit. The greatest need that we have at the medical center is for a new library. The present one is cramped, has seats for only 60 of the 1,000 people who must use it, and has no space into which it can expand. Further, the weight of the books is a constant threat to the structural soundness of the administration building which was not constructed to withstand such weight. For these reasons we are going to request the next legislature to appropriate from the Educational Building Fund sufficient funds to erect a two-story library unit. This is the only building request that we will advance.

Your medical school continues to attract national attention and to increase in stature. All of this is a tribute to your continuing support and enthusiasm for it. I am looking forward to many more years of close co-operation—in my dual position as director of your medical center and member of the Kansas Medical Society.

Kansas Medical Day

The annual Kansas Medical Day was held at the University of Kansas School of Medicine on Monday, March 8, 1954. In charge of the program was Dr. Lucien R. Pyle, Topeka, president of the Kansas Medical Society, and the audience consisted of 225 junior and senior students.

The program included opening remarks by Dr. W. Clarke Wescoe, dean of the school, and Dr. Mahlon H. Delp. Mr. Carl C. Lamley, superintendent of Stormont-Vail Hospital, Topeka, and president of the Kansas Hospital Association, spoke on the physician's responsibility in the hospital. The continuing interest by the medical board in the practicing physician was discussed by Dr. Murray C. Eddy, Hays, a member of the Kansas State Board of Medical Registration and Examination and president-elect of the Kansas Medical Society. Blue Cross-Blue Shield as a phase of prepaid health insurance was discussed by Dr. Henry S. Blake, Topeka, president of Kansas Blue Shield, and by Mr. Proctor Redd, Topeka, director of professional and public relations.

Mr. Albert M. Ross, Kansas City, examiner for Workmen's Compensation, discussed the physician's duties and responsibilities under the Workmen's Compensation program. Mr. Ernest H. Hall, Kansas City, Missouri, narcotic agent, spoke on the physician's responsibility toward complying with the requirements of the Harrison Narcotics Act. Services of county and state medical societies to physicians were described by Mr. Ray Selbach, executive secretary of the Shawnee County Medical Society, Mr. H. Martin Baker, executive secretary of the Sedgwick County Medical Society, and Mr. Oliver E. Ebel, executive secretary of the Kansas Medical Society.

A coffee period in the Student Union Building concluded the day's activities.

Cancer Conference in Wichita

Arrangements have now been completed for the Sixth Annual Mid-West Cancer Conference to be held at the Broadview Hotel, Wichita, April 1 and 2, 1954. Although the program is primarily scientific, a social event will be included—a banquet the evening of April 1 to which both doctors and their wives are invited. Dr. Cornelius P. Rhoads, director of Memorial Hospital, New York City, will be the banquet speaker.

Biographical notes on several of the guest speakers were published in the January and February issues of the JOURNAL. Information on other guest lecturers is given below.

Dr. A. N. Arneson, St. Louis, is professor of clinical obstetrics and gynecology and associate professor of clinical radiology at Washington University School of Medicine. He received his medical degree from the same school in 1928. Dr. Arneson is a diplomate of the American Board of Radiology and of the American Board of Obstetrics and Gynecology and is a fellow of the American College of Radiology. He is a member of the Radiological Society of North America and of the American Radium Society.

Dr. Hugh F. Hare, Los Angeles, is associated with the Los Angeles Tumor Institute. He was graduated from Harvard Medical School, Boston, in 1928. In addition to being a diplomate of the American Board of Radiology, he is a fellow of the American College of Radiology and a member of the Harvey Cushing Society, American Roentgen Ray Society, Radiological Society of North America, and American Radium Society.

Dr. N. L. Higinbotham, New York City, who is associate clinical professor of surgery at New York Medical College, is a graduate of McGill University Faculty of Medicine, Montreal, with the class of 1926. He is a diplomate of the American Board of Surgery and a fellow of the American College of Surgeons.

Dr. Higinbotham is also assistant clinical professor of surgery at Cornell University Medical College.

An important member of the staff of the Overholt Thoracic Clinic, Brookline, Massachusetts, who will take part in the program is Dr. Richard H. Overholt. He is also on the staff of the New England Deaconess Hospital. Dr. Overholt was graduated from the University of Nebraska College of Medicine in 1926. His memberships include the New England Surgical Society, the American Association for Thoracic Surgery, and the American Roentgen Ray Society. He is a diplomate of the American Board of Surgery and a fellow of the American College of Surgeons and of the American College of Chest Physicians.

The conference is being sponsored by the Kansas Division of the American Cancer Society and the Committee on Control of Cancer of the Kansas Medical Society. All physicians in Kansas and adjoining states are invited to attend. No registration fee will be charged.

Good public relations for the medical profession begin in the office of each individual doctor.

K.M.S. annual meeting, May 2-6, 1954, Topeka.

BLUE SHIELD

Sponsorship on the Local Level

The new Blue Cross-Blue Shield non-group enrollment seems to be off to a fine start. Campaigns were completed in nearly 25 counties during January and February, and in many counties results have been even more successful than had been anticipated.

More than ever in this year's new program, the importance of participation or sponsorship by the medical profession at county medical society level has been emphasized. It is only natural that the prospective members feel a closer relationship with Blue Cross-Blue Shield when they can be assured their own physician and local hospital are directly connected with the program.

WHAT CAN BE DONE

There are many ways that members of county medical societies can co-operate in the community enrollment program. They can sponsor endorsement advertising in the local newspapers; they can announce in public news stories that they have pledged their co-operation; they can mail literature with their billings to patients prior to the enrollment; they can use their offices as information centers, and keep their assistants well informed on the program in order that they can answer questions about Blue Cross-Blue Shield services.

When the county medical society has agreed to participate in enrollment, literature and material will be furnished by the Blue Shield office. Members of the Blue Cross-Blue Shield staff are presently appearing at county medical society meetings and medical assistants' meetings to explain the new program in all of its aspects.

The Douglas County Medical Society might well be cited as one of the organizations in the state which has participated in practically all of the projects listed above. The society as a whole served as the sponsoring organization for the county-wide enrollment; Dr. J. W. Campbell, president of the society, was the chairman of the campaign, giving the enrollment a definite local tie-in.

The society sponsored a paid newspaper advertisement announcing the campaign. Dr. Penfield Jones, long active in the Blue Shield program, a medical society councilor, and president of the Kansas State Board of Health, appeared on a 15-minute radio interview over station KLWN at Lawrence in which he explained the services of Blue Cross-Blue Shield. Dr. G. E. Manahan, Blue Shield Relations Committee Chairman from District II, also played an important role in the program.

Enrollments to be held in March include Bourbon, Ellis, Finney, Franklin, Jewell, Marion, Marshall, Pratt, Reno, Smith, and Thomas counties.

Nominations for 1954-1955

In accordance with provisions of the Constitution and By-Laws, the Nominating Committee of the Kansas Medical Society announces here the names of candidates who will be listed on the ballot for the annual election to be held on May 6, 1954. Additional nominations, of course, may be made from the floor.

Because some of the members of the Kansas Medical Society might not be personally acquainted with each of the physicians nominated for office, the committee submits the following brief data.

For President-Elect

Dr. John M. Porter, Concordia, has served as secretary and second vice-president and is currently first vice-president of the Kansas Medical Society. He has also been delegate to the American Medical Association and president of the Kansas Heart Society.

For First Vice-President

Dr. Clyde W. Miller, Wichita, has been a councilor and is currently second vice-president of the Kansas Medical Society. He was chairman of the Committee on Public Relations and was the first president of the Kansas Academy of General Practice.

For Second Vice-President

Dr. Conrad M. Barnes, Seneca, besides numerous offices in his local society, has been a member of the Dean's Advisory Committee for the School of Medicine at the University of Kansas and has been president of Kansas Blue Shield.

Dr. Louie J. Beyer, Lyons, has long been an active participant in Kansas politics and has served as a national committeeman from this state. Besides offices in his local society, he has served six years on the Council of the Kansas Medical Society.

Dr. Thomas P. Butcher, Emporia, has held numerous offices in his county society, including its presidency. He has been chairman of the Kansas Medical Society Committee on Allied Groups and has served on other committees.

Dr. Dwight Lawson, Topeka, besides numerous offices in his county medical society, has served as president of Kansas Blue Shield and is a member of the Editorial Board.

Dr. John W. Randell, Marysville, besides numerous offices in his county society, has been a member of the Council of the Kansas Medical Society and for the past several years has been chairman of the Committee on Endowment.

For Constitutional Secretary

Dr. James A. Butin, Chanute, has held numerous offices in his county medical society and has been active in the work of the district society of the nine-county area comprising the third councilor district.

Dr. Karl E. Voldeng, Wellington, besides numerous offices in his county society, has been chairman of the Committee on Control of Cancer and is now president of the Kansas Division of the American Cancer Society.

For Treasurer

Dr. John L. Lattimore, Topeka, has been an active participant in Kansas politics, having served four terms in the legislature. He has been president of the Kansas Medical Society and is currently treasurer.

For A.M.A. Delegate 1955-1956

Dr. Laurence S. Nelson, Salina, has been president of the Kansas Medical Society and is currently delegate to the American Medical Association. He has also served the state as a member of the Kansas State Board of Health.

For A.M.A. Alternate 1955-1956

Dr. Lucien R. Pyle, Topeka, has been editor of the Journal and was formerly chairman of the Volunteer Advisory Committee for Kansas. He is currently president of this Society.

Dr. Frederick E. Wrightman, Sabetha, besides serving his county society in various capacities, has been a member of the Legislative Committee and has served as a Kansas representative of the A.M.A. Committee on Legislation.

Annual Meeting, May 2-6, 1954

Committees in charge of the annual meeting of the Kansas Medical Society to be held at Topeka, May 2-6, report all is now in readiness. The program has been arranged, social events have been scheduled, and specialty societies are going ahead with plans for separate meetings.

In general, the outline of former years will be followed, although one change has been made in the schedule for scientific sessions. During each morning session on Tuesday, Wednesday, and Thursday, guest speakers will present papers. The afternoon sessions on Tuesday and Wednesday will be given over to panel presentations, two each day on different subjects. Guest speakers will also participate in the panels. Separate sessions, as usual, will be held for physicians engaged in eye, ear, nose, and throat practice.

The following speakers from out-of-state will present the program:

David D. Akers, M.D., Denver, Colorado
Frederic Burke, M.D., Washington, D.C.
James R. Cook, M.D., Cleveland, Ohio
Oliver Cope, M.D., Boston, Massachusetts
Charles E. Iliff, M.D., Baltimore, Maryland
Ormand C. Julian, M.D., Chicago, Illinois
Andrew A. Marchetti, M.D., Washington, D.C.
Paul M. Moore, M.D., Cleveland, Ohio
Shepard Shapiro, M.D., New York, New York
Maurice Stauffer, M.D., Rochester, Minnesota
Bernard A. Watson, M.D., Clifton Springs, New York

Complete information on the annual session will be published in the April issue of the Journal.

Party Honoring Mrs. Schaefer

A party in honor of Mrs. Leo J. Schaefer, president of the Woman's Auxiliary to the American Medical Association, was given by the Saline County Medical Society at the Salina Country Club on February 3. The guest list included all officers and councilors of the Kansas Medical Society and of its Auxiliary.

Dr. Franklin D. Murphy, chancellor of the University of Kansas, made the address of the evening. The program included a reception, dinner, and dance.

Mrs. Schaefer is the first Kansan to hold office in the women's national organization.

Although medical social work is a relatively young profession, there are approximately 3,825 persons actively engaged in this work in the United States today, according to a recent release from the U. S. Department of Health, Education, and Welfare. There are, however, three times as many positions open in this field as there are persons to fill them, and it is estimated that 800 to 1,000 graduates a year will be needed to fill vacancies.

The largest number of social workers, approximately 41 per cent, are located in the northeast section of the country. Three-fourths of the total are employed in hospitals and clinics, while the two next largest groups work with the physically handicapped and other special groups. Most medical social workers are women, 93 per cent, although the number of male graduates from social work courses is gradually increasing.

Attend the annual meeting, Kansas Medical Society, Topeka, May 2-6, 1954.

Parotid Tumors

Tumor Conference

Edited by Chauncey G. Bly, M.D., and Bernard L. Klionsky, M.D.

Dr. Helwig: Today we have a group of three patients with tumors of the parotid gland. The first two cases illustrate some of the usual difficulties encountered in dealing with these tumors. The last case poses current difficult problems in both diagnosis and management.

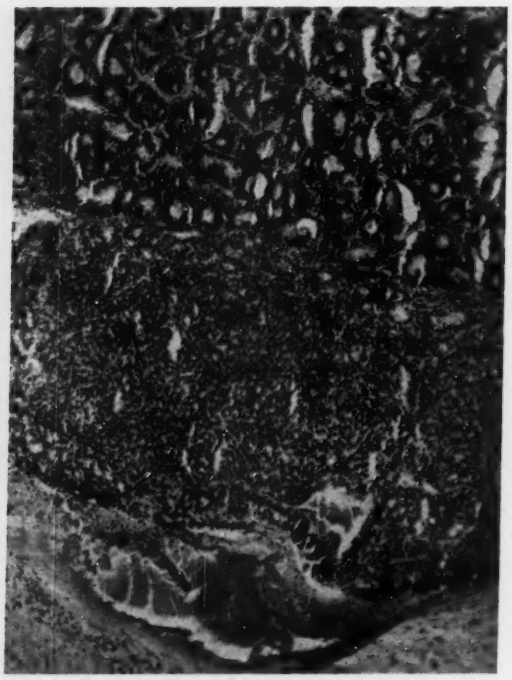


Figure 1. Benign parotid adenoma (case 53-99). This area shows the focus of transition from the typical acinar or duct-like structures above, to solid sheets of poorly differentiated atypical cells, still enclosed by the fibrous capsule seen at the bottom. X 82. Hematoxylin and eosin.

CASE NO. 53-99

Dr. Saffier: This 54-year-old white male states that he had mumps five years ago. The swelling or mass did not subside, however, but lay dormant until one year ago, when some local discomfort began to appear. X-ray films of the area revealed no stone or obstruction of Stensen's duct. The tumor mass was biopsied here and two days later was completely removed.

Dr. Boley: In both the biopsy and the final operative specimen, the tumor is well enclosed by a capsule, showing hemorrhage and edema of operative origin. The tumor itself is composed primarily of columnar cells forming uniform duct-like structures or acini with scant supporting stroma. We are impressed by the high degree of cellularity of the tumor and by the few small areas of necrosis.

One of the final sections (Figure 1) shows a focal transition from duct-like arrangement of columnar cells to sheets of solidly packed paler polygonal cells. Other areas show slight nuclear variation. In one area, a few acini or collections of cells are seen within the fibrous capsule. Despite these occasional atypical features, we cannot call the tumor an adenocarcinoma since it is so well encapsulated. Our final diagnosis was and is: parotid adenoma with atypical changes and local infiltration of the capsule, meaning that this patient should be carefully followed.

Dr. Robinson: This case illustrates some of the operative difficulties encountered in dealing with parotid tumors. A large mass, 3 cm. in diameter, was found to be tightly wedged into the neck tissues below the angle of the mandible. The tumor had apparently arisen in the retromandibular part of the parotid and grown forward, displacing the normal part of the gland and stretching and spreading out the branches of the facial nerve. Since the biopsy indicated this to be a benign parotid adenoma, we preserved the facial nerve by tediously dissecting each of the branches completely free and removed the tumor from below. When we were through, the patient had a facial nerve which was totally intact anatomically, but not functionally. It has now been five months since the operation, and, as you can see, the patient's nerve function has been considerably restored. He can wrinkle his forehead and eyelids, but there is still some facial droop and asymmetry on smiling. However, we expect all of this residual dysfunction to return to normal within the next few months.

CASE NO. 53-100

Dr. Saffier: This second patient is a 44-year-old colored man who has a mass in the right side of the neck. The tumor had grown steadily and slowly over 1½ years, but produced no symptoms.

On examination, a smooth, firm, movable, well circumscribed, non-tender subcutaneous mass about

Cancer teaching activities at the University of Kansas Medical Center are aided by grants from the National Cancer Institute and the Kansas Division of the American Cancer Society.

Dr. Bly is a Scholar in Cancer Research of the American Cancer Society. Dr. Klionsky is a Trainee of the National Cancer Institute.

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1. Hild, A. M.: Schweiz. med. Wchnschr. 71:557, 1941.
2. New and Nonofficial Remedies. J. B. Lippincott Co., Philadelphia, 1953, p. 200

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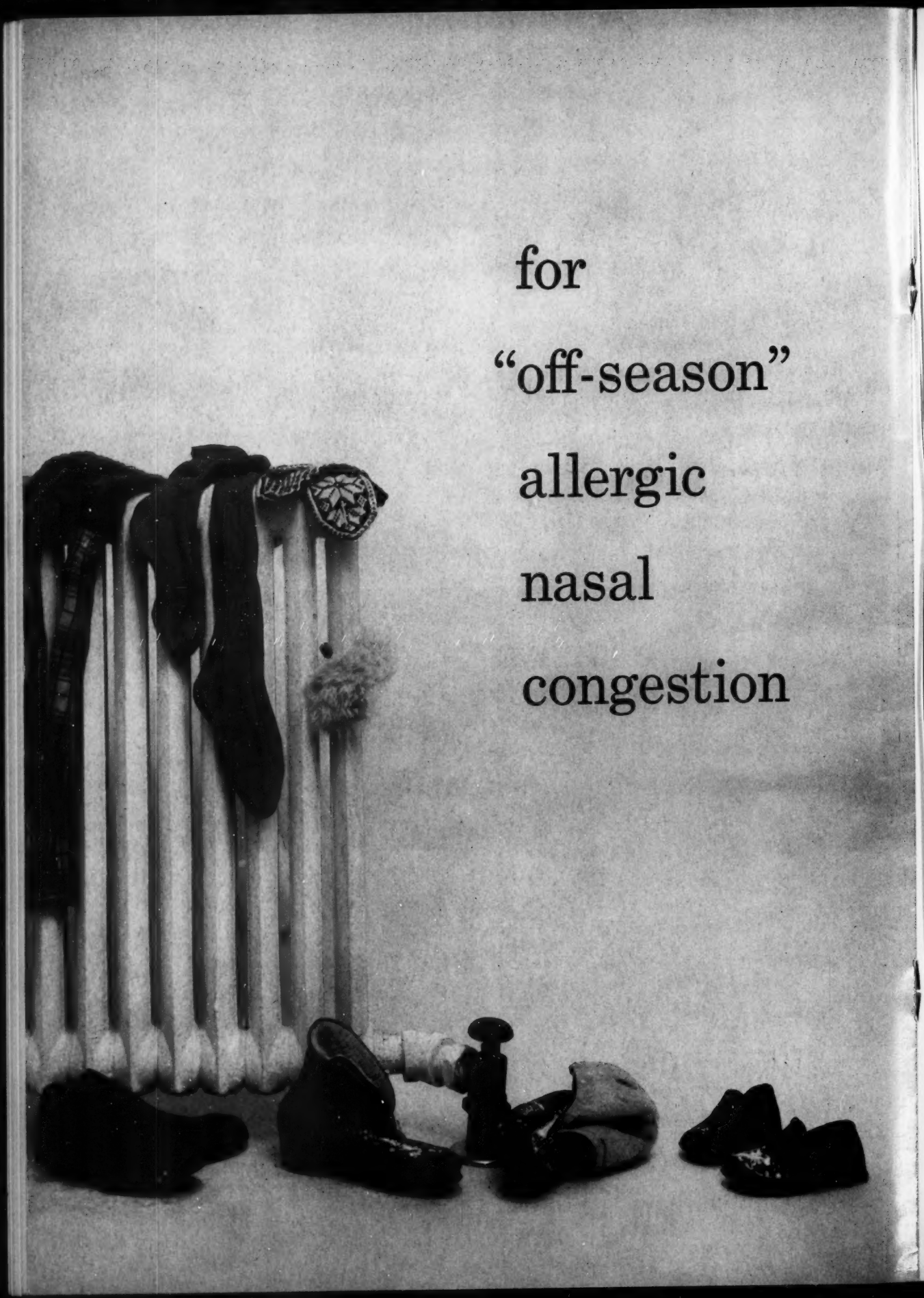
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1. Dill, J. L.: Postgrad. Med. 4:413, 1948.

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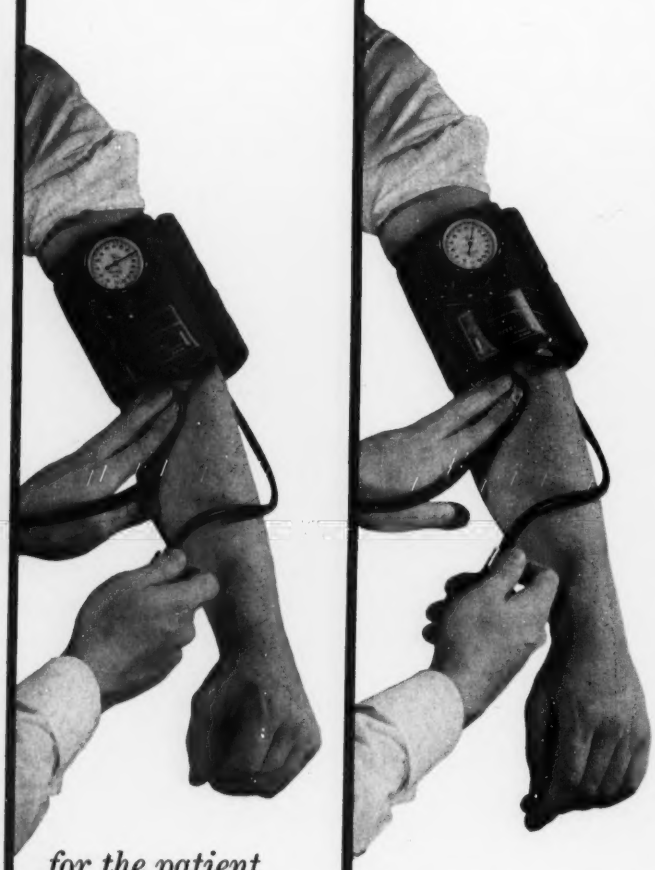

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therapy is generally well tolerated with initial low dosages, gradually increased.[1,2,3] Patient response is the guide to dosage adjustment.[4] Optimal maintenance dosage level is usually reached only after 3 weeks or more; marked therapeutic effect cannot be expected with initial low dosages.[4]

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1. Hafkenschiel, J. H., and Lindauer, M. A.: Circulation 7: 52, 1953.
2. Schroeder, H. A.: Circulation 5: 28, 1952.
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6 cm. in diameter was felt over and behind the ramus of the right mandible. The bulk of the tumor appeared to be in the anterior superior triangle of the neck. The remainder of the physical examination was negative. Our clinical impression was mixed tumor of the parotid.

At operation a firm, encapsulated mass deep in the parotid gland was removed by sharp dissection during which the capsule was inadvertently opened. One week after the surgery there was still some firm swelling in the operative area with some evidence of persistent right lower facial weakness.

Dr. Boley: This tumor is lobulated but does not have the cartilaginous, slimy appearance which many mixed tumors of the parotid have. By gross and microscopic examination, the tumor is fairly well encapsulated, although the thickness of the capsule varies markedly from area to area. The tumor generally is more cellular than are most mixed tumors. The slight palisading of nuclei seen in some of the most cellular

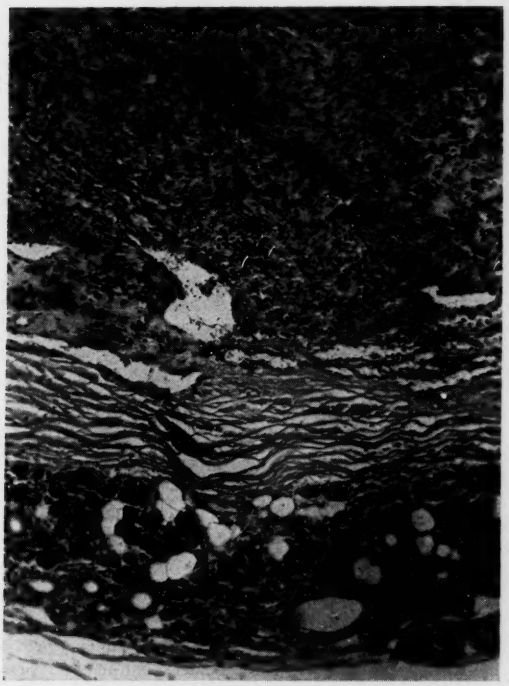

Figure 2. Benign mixed tumor of parotid (case 53-100). This unusually cellular area containing spindle-cells with slight nuclear palisading, and minimal stroma is separated by thick fibrous capsule from the slightly compressed normal parotid acini and ducts below. X 47. Hematoxylin and eosin.

areas (Figure 2) is not so marked as in the Verocay bodies seen in neurogenic tumors. In some areas, there are cribriform or cylindromatous patterns with much mucoid stroma (Figure 3). In other areas definite acini and hyalinized stroma are found. No mitoses, marked nuclear variations, or frank invasion of blood vessels are seen. This is a benign cellular mixed tumor of the parotid. However, the tumor is likely to recur, particularly with the break in the capsule during surgery.

Dr. Helwig: It seems that we have already opened up two fields of discussion—problems in operation and in diagnosis. Dr. Robinson, would you elaborate

Figure 3. Benign mixed tumor (also case 53-100). This more usual area of the tumor shows less cellularity and prominent muco-hyaline change in the stroma. X 82. Hematoxylin and eosin.

on some of the factors which concern you in the general treatment of the patient with a benign tumor of the parotid.

Dr. Robinson: Certainly the treatment of choice for adenomas or benign mixed tumors of the parotid is surgical removal. In the sphere of technical problems, the main operative and postoperative difficulties which arise are related to the facial nerve. Much too often in the past, over-conservative operations such as simply shelling the tumor out of its pseudocapsule, have been done primarily in order to save the nerve. One must, however, balance nerve preservation against chances of tumor recurrence.

Thus, one must first decide how much of the normal parotid gland should be removed with the tumor. Although surgeons differ in recommendations on this point, we like to have a cuff of normal parotid tissue 3 mm. thick all around the tumor capsule. This is not always possible if one wants to leave the facial nerve intact. However, in almost all cases of benign parotid tumors, the nerve branches can actually be dissected out without causing permanent damage. Even when one takes off a cuff of normal parotid around the tumor, including the capsule or pseudocapsule, one

will have some recurrences. These must be considered as more than just multicentric origin of the primary tumor.

It is much harder of course to do the proper operation, removing a cuff of normal tissue with the tumor. There are no good planes of cleavage, and one must dissect each millimeter very carefully with knife or scissors, testing as he goes, to make sure that he is not making the face twitch. The entire face must be draped out and someone assigned just to watch the face all the time.

The difficulty in continuous observation of the nerve function is one reason these benign tumor excisions cannot be done as out-patient procedures. Using local anesthesia, one cannot tell whether the nerve is capable of working or not when it is directly stimulated. Even after the operation, the local anesthetic effect is maintained enough that one still is unable to tell whether the nerve is working well. Furthermore, since local blocking of the nerves is not technically good enough for adequate anesthesia, it is necessary to field infiltrate. During this latter procedure, the tumor itself may be inadvertently punctured by the needle, thus increasing the chances for tumor recurrences.

Dr. Boley: I would like to know how disturbed Dr. Robinson is when he discovers that the patient's face is paralyzed the day following operation. A less experienced surgeon might become worried at such a finding.

Dr. Robinson: No surgeon likes to see his patient grimacing, or drooling, or talking from the side of his mouth as a result of an injury to the facial nerve. If I know that I have left the nerve anatomically intact, that I have dissected practically all of the soft tissue, and that the blood supply has been undisturbed, I expect that normal function will eventually return. Most will function normally as soon as any postoperative edema disappears. Few show even as moderate a defect as does the first patient we showed, but even in those, function will eventually return.

Dr. Tice: In what percentage does surgery result in damage to the facial nerve? How hard is it to find the facial nerve during operation?

Dr. Robinson: I have not looked up our statistics recently, but I should guess that there has been permanent damage to the facial nerve in much less than 10 per cent of cases operated on for benign parotid tumors. By permanent, we mean damage in which there has not been recovery in a few months' time, since it may take up to 18 months for complete regeneration of the facial nerve fibrils along the axon sheath after functional damage. It is not as hard as one might think to find the facial nerve. It has long been know that a branch of it will be invariably found if one follows the communicating posterior branch of the facial vein up to the lower pole of the parotid and into the gland. This branch of the facial nerve can then be traced to the main trunk.

Dr. Helwig: The second broad topic for discussion is the problem of diagnosis of parotid tumors. Dr. Boley, I know you have some general feelings on this subject.

Dr. Boley: A specific diagnosis on a given parotid tumor is sometimes difficult for the pathologist to make. There are many different and some elaborate classifications, and some tumors seem to defy any of these classifications. The term "mixed tumor" is widely used on the basis that this type of tumor contains a mixture of epithelial elements and stromal or mesenchymal elements, both showing neoplastic changes. About two-thirds of all parotid tumors are classified under this name. However, the more areas the pathologist studies from each parotid tumor, the more different types of epithelial and stromal change he will find in each tumor. Moreover, as illustrated in our first two cases today, atypical changes are not infrequent. Willis[1] goes so far as to state that both the concept and the name, "mixed tumors," are misuses since he feels, in all of these types of tumors, that only the epithelium shows neoplasia and that the stromal changes are secondary and incidental. Instead of designating this type as mixed tumor, he would use the terms pleomorphic adenoma or adenocarcinoma, depending on whether the tumor is benign or malignant.

Dr. Robinson: There are several useful points to keep in mind when arriving at a clinical diagnosis, before biopsy or excision. It's fairly easy to say that those parotid tumors which to palpation are quite hard and firmly fixed are malignant, but they are not always malignant. We have found them sometimes in anatomical positions where they are so tightly squeezed by growth between bony parts that they are apparently clinically fixed, but are not really fixed. For example, a few, growing between the angle of the mandible and the mastoid, are so tightly bound as to give the impression that they are malignant and will necessitate radical surgery. However, one often finds during the operative procedures that they are not fixed, but can be completely removed.

Generally, parotid tumors that cause pain are malignant. Tumors that involve the facial nerve to such an extent that the nerve does not function well preoperatively are usually malignant. Factors of sex or race are not important diagnostically.

Mixed tumors of the parotid gland can occur at any age, but they usually occur between the ages of 20 and 40 years. The patient himself may accidentally feel the tumor for the first time, or have the swelling brought to his attention by someone else. Mixed tumors grow quite slowly, usually without any symptoms or signs other than the swelling or enlargement. Carcinomas of the parotid gland tend to grow more

quickly, occur in older age groups, cause pain, and are stony hard.

Dr. Johnson: Usually the main thing that a surgeon would like to know before operation is whether he is dealing with a relatively benign or with a malignant tumor, since the management is different. There are tumors that clinically seem obviously benign, while others seem obviously malignant. There is always a smaller group between, in which the clinical impressions are uncertain. In some of these latter cases, needle aspiration biopsy has been done preoperatively in the hope that we as pathologists could differentiate the benign from the malignant lesions. I must confess that in only relatively few instances has an aspiration biopsy helped us to make a decision. We are continuing to evaluate this procedure, however.

Dr. Robinson: Although the surgeon occasionally will do an open biopsy of the parotid, there is the one real danger previously mentioned. If the tumor is surrounded by a pseudocapsule, there are chances that, by breaking it, one will contaminate the operative field with tumor cells, whether benign or malignant, which may then be possible foci of recurrence. Therefore, we do not like to do a biopsy just before starting one of these operations.

One point of help during the exposure of the tumor is that if one sees tumor growing around nerves, he can be reasonably sure that it is not a benign tumor grossly. Sometimes I need to call Dr. Boley to observe the gross tumor and to do a rapid frozen section of the tumor to find out microscopically what we are dealing with, so that I can decide the extent of operative procedures necessary. Such was done in the first case discussed today, where some of the nerve branches appeared almost to be imbedded in the surface of the tumor bulging up from behind the mandible; frozen sections showed the tumor to be benign and everywhere enclosed by fibrous capsule.

The proper treatment of a benign parotid tumor has already been discussed. Whenever one is sure that he is dealing with a malignant tumor, he must forget conservatism and nerve preservation and do radical tumor surgery, even though this may necessitate removal of the entire area. For example, one may have to pick up and divide the trunk of the facial nerve, chisel off parts of the mandible and the mastoid bones, and remove the ear canal along with the tumor, if necessary. Even if such extensive surgery is performed, the chances of salvage with an advanced malignancy are very poor. One should not, however, give up completely, or he will lose all of his patients with advanced carcinoma, including the small salvageable group.

CASE NO. 53-101

Dr. Saffier: This third case is a 7½-year-old boy who came in because he had a swelling of the left parotid area of three months' duration. When we first saw him, the tumor growth was lobulated and about 3 cm. in diameter, appearing grossly rather typical of the mixed tumor type. Upon exploration, the tumor still looked superficially like a mixed tumor. However, as the dissection was carried anteriorly, it was noted that the tumor had involved branches of the facial nerve and invaded the masseter muscle.

Dr. Boley: In this case, adipose tissue and fibrous tissue blend in with tumor tissue, with no true capsule to separate tumor from parotid gland or muscle. Most microscopic fields of the tumor show clumped and free larger rounded cells intermingled with irregular bands of spindle-shaped elongated cells with possibly some small processes. Some mitotic figures are seen. Special stains showed that this tumor is forming some reticulin with no set pattern, although it tends to surround occasional groups of cells or single cells. This production of some reticulin suggests that this tumor may be a sarcoma rather than a very anaplastic carcinoma of the parotid gland.

Dr. Robinson: From the moment we saw the gross involvement of masseter muscle and twigs of the facial nerve, we felt that this boy's prognosis was poor. Even though we were able to get fairly well around the tumor, the gross and histologic appearance of the tumor seems to preclude further radical surgery in a boy of this age.

I asked Dr. Tice to see him with us. He gave him a course of x-ray therapy, feeling that since this was an anaplastic tumor it might respond favorably. We saw the boy again three days ago and felt some small shotty nodes in the neck. These might represent merely reaction from the operation and radiation therapy, although they may have more serious import. We will probably watch him a little while before doing anything more. Certainly if these nodes contain metastases, further surgery will probably be of little value.

Dr. Tice: We gave this boy about 2,000 roentgens to the localized area and to the neck glands, a dose which will ordinarily kill a highly anaplastic tumor. We have to keep in mind also the growing bones in the area. For example, we will certainly have already damaged that growing mandible with the dose that we have given. If he survives, he will also have trouble with his teeth and may lose them. On the other hand, he might still have tumor present from which he will die if we do not give him further heavy doses of radiation. The problem we face is how far we dare treat him in the future if necessary.

Dr. Robinson: Malignant tumors are not the only ones in which we must decide whether any further treatment is indicated. We saw in the clinics today a man who has swelling in the left parotid gland region, which becomes more prominent when he eats or drinks. There is a slightly tender freely movable but indiscrete firm thickening in the belly of the

masseter muscle. This mass has been present for about 7 years.

Two years ago he had pain in the left cheek. After dissecting through some of the fibers of the masseter muscle, we found a 1.0 cm. nodule which popped out of its capsule. Dr. Boley, recalling one parotid tumor in which the entire center was infarcted, was unable to find any tumor cells even around the periphery and called this an organized hematoma.

We have not tried to visualize any possible obstruction in Stensen's duct. Dr. Tice tells me that either Lipiodol or Diodrast would work quite well. Until we have more evidence that this mass might be a tumor, rather than just fibrous tissue with partial duct obstruction, no further treatment seems indicated. If we do more surgery, we are almost sure to damage the facial nerve because of technical difficulties related to the scar tissue from the previous operation and inflammation in the area.

Dr. Helwig: As we look back over parotid tumors in general, I would like to re-emphasize that there is still that small group of tumors where, even with the whole tumor specimen to examine, the pathologist cannot be too sure of the relative benignancy or malignancy. Fortunately, that group is relatively small. To help us, we now have the article by Foote and Frazell.[2] This is one of the finest articles I have ever seen on tumors of the parotid, based on patients studied over a 20-year period at Memorial Hospital in New York. In their group of 877 cases of salivary gland tumors, 551 (63 per cent) were mixed tumors, and only 57 of those were malignant. This figure corresponds roughly with that reported by most people, 10 to 15 per cent of mixed tumors being malignant. As one studies carefully the photomicrographs in this article, he may wonder whether some of the tumors shown should have been called benign or malignant. However, he must bow to the very excellent follow-up on actual behavior which supports the decisions of these authorities.

Dr. Robinson: In the 25 or so cases of mixed tumors of the parotid that we have seen here in the past five years, there seems to be a much higher percentage of malignancy, around 40 per cent, than in other larger series. This may be a reflection on the smaller size of our series.

Dr. Helwig: Are they really malignant, or are they merely called malignant because they recurred?

Dr. Boley: No, these figures on malignant mixed tumors are based upon histological criteria similar to those of Foote. Moreover, since 65 per cent of the salivary gland tumors seen here are mixed tumors, and 12 per cent are mucoepidermoid carcinomas, about the same ratios as seen in Foote's much larger series, we do not appear to be confusing these two types of tumor.

Dr. Robinson: I do not think that, in our concluding remarks, we can over-emphasize the problem of recurrences, so characteristic of mixed tumors of the parotid. Even if one is sure that the tumor is benign, he should not simply shell it out from its capsule or he may expect to find recurrences in up to 40 or 50 per cent of his cases. Attempts to preserve the facial nerve in operations on malignant mixed tumors will also result in a high percentage of recurrences since tumor cells will usually be left behind with the nerve. Fortunately, metastases from malignant mixed tumors are uncommon, and recurrences form the major problem.

Dr. Boley: In the past, many of the recurrences were accounted for by assuming the primary tumors to be of multicentric origin. Foote[1] makes the statement now that in his group of 551 mixed tumors, he has never seen one of multicentric origin. Only in those tumors that had previously been operated upon have there been multiple nodules. Sometimes as many as 8 or 10 nodules had apparently arisen from seeding during inadequate surgery or interference, producing thereby a multinodular tumor. He believes that there are fewer than five well documented cases in which multiple primary nodules have been found in mixed tumors of the parotid gland.

Dr. Joffe: How long does it require for a benign tumor to recur after inadequate excision?

Dr. Robinson: One of the difficult things about evaluating surgery of parotid tumors is that the recurrences come very slowly and insidiously. For that reason, one should follow these patients at definite intervals to evaluate critically the problem of recurrence. For the most part, we do not find recurrences in less than 6 months, but we do find them on an average of one to two years after excision. Sometimes recurrences appear after 4 or 5 years or rarely even later than that. Many surgeons feel that if 5 years have gone by without recurrence, the patient has been cured. We have had one patient who had a recurrence of a cylindromatous growth of the submaxillary gland after 12 years.

On the other hand, if a benign mixed tumor should recur and be inadequately treated a number of times, the tendency is for each recurrence to look a little bit different and more malignant than the preceding recurrence.

Dr. Helwig: Mixed tumors to me are either predominantly cylindroid or predominantly mesenchymal. It has been my experience, and also that of the group at the Mayo Clinic,[3] that the more predominantly cyclindroid they are, the more tendency there is to local recurrence and invasion. One patient who had a cylindromatous type of mixed tumor simply shelled out of the hard palate, died five or six years later of meningeal involvement by recurrent tumor. On the other hand, I have been following a patient who is still alive and well after multiple excisions of re-

currences from a cylindromatous tumor removed from the tongue 47 years ago.

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COUNTY SOCIETIES

A meeting of the Riley County Society was held in Manhattan on January 20. Dr. Donald L. Rose, chairman of the Department of Physical Medicine, University of Kansas Medical Center, spoke on "The Conservative Management of the Painful Shoulder."

Dr. J. R. Pritchard was named president of the Bourbon County Society at a meeting of the group held in January. Dr. L. P. Randles was elected secretary.

Dr. Mahlon H. Delp, associate professor of medicine at the University of Kansas Medical Center, addressed the Sedgwick County Society at a meeting at the Lassen Hotel, Wichita, on February 2. His subject was "Contraindication of ACTH, Cortisone and Relative Compounds."

A meeting of the Smith County Society was held at the home of Dr. Victor E. Watts, Smith Center, on January 28. An oyster supper was served. During the business session, the following officers were elected: president, Dr. Victor E. Watts; vice-president, Dr. Buford Hartman, Kensington; secretary, Dr. Hugh G. Woods, Smith Center; delegate to state meeting, Dr. Hartman; alternate, Dr. Lafe W. Bauer, Smith Center.

A tumor clinic was a feature of the February 1 meeting of the Shawnee County Society. Dr. A. A. Fink served as moderator. Dr. Robert Brooker spoke on lung tumors, and Dr. Robert P. Woods discussed brain tumors. A professional education film prepared by the American Cancer Society was shown.

Members of the Montgomery County Society assisted in a Blue Cross-Blue Shield enrollment campaign during February by designating their offices as information centers for those wishing data on the plans.

Dr. M. D. Atwood was elected president of the Edwards County Society for 1954. Other officers are: vice-president, Dr. R. T. Unruh; secretary, Dr. Frank G. Meckfessel; delegate, Dr. R. E. Schnoebelen; alternate, Dr. W. P. Stoltenberg. The society gave its approval to a suggestion of the dentists of the county that fluorine be used in the Kinsley water supply.

A meeting of the Harvey County Society was held on February 1 with representatives of Blue Cross-Blue Shield as guests. Guest speaker for the evening was an attorney, Mr. D. W. Wheeler, Marion, who presented a paper, "Malpractice and Supreme Court Suits and Problems of Experimental Medicine."

Dr. Earl E. Miller was elected president of the Crawford County Society at a meeting held on January 30. Dr. David J. Lyons was chosen as vice-president, and Dr. James H. Bena was named secretary-treasurer.

A meeting of the Wyandotte County Society was held at the University of Kansas Medical Center on February 16. For the scientific program, Dr. Herbert C. Miller spoke on "Respiratory Difficulties in the Newborn," and Dr. E. Grey Dimond discussed "Inferior Vena Cava Ligation for Intractable Right Heart Failure."

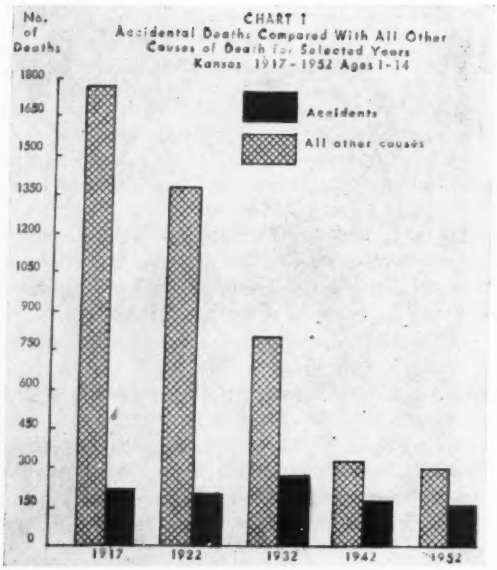
At a recent meeting of the Marshall County Society, Dr. John W. Randell was named president for 1954 and Dr. Henry H. Haerle was elected secretary.

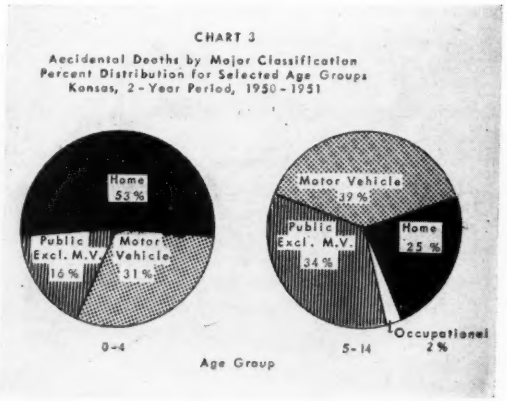
Dr. Clarence W. Erickson, Pittsburg, was guest speaker at a meeting of the Labette County Society held at the Parsons Country Club on February 10. His subject was "Hypertension."

Modern scientific discoveries have brought such great changes in medicines that 90 per cent of the physicians' prescriptions today could not have been written a scant 15 years ago. This great progress would seem to all but eclipse ancient methods of medication. But, on the contrary, the value and potency of many barks, roots, and leaves are so great they still are imported from far-off places for use as ingredients in some medicines.—*J. R. Anderson, chief pharmacognosist, Parke, Davis and Company.*

Accidents in Childhood

Prepared by the Committee on Child Welfare





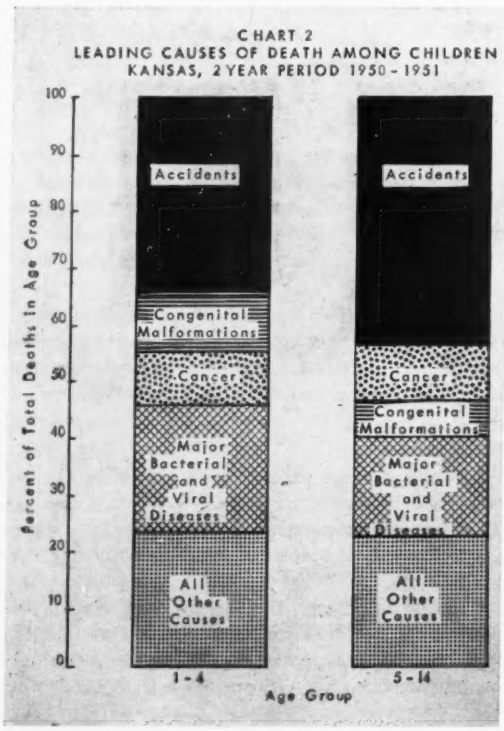


TABLE I

TYPES OF HOME ACCIDENTS BY 5 YEAR AGE GROUPS FOR AGES UNDER 15 YEARS
KANSAS 1952

	0-4	*5-9*	*10-14*
Burns, Conflagrations, Explosions	17	8	3
Suffocation, foreign objects	11	0	0
Mechanical Suffocation	7	0	0
Drownings	6	0	0
Poisonings, solids or liquids ...	4	0	0
Falls	4	2	0
Firearms	1	0	5
Electrocution	1	0	1
Poisonings, Gas	1	0	0
Other	6	0	0

Accidents in Childhood

Prepared by the Committee on Child Welfare

Along with immunizations, scientific nutrition, sulfonamides and antibiotics, and the science of child development, apparent changes have come in the relative importance of the various causes of childhood morbidity and mortality in Kansas as well as elsewhere.

As the other important causes of childhood deaths have been brought under control, the persistent accident toll in our childhood population has yielded only slightly (Chart 1). Today accidents are the greatest single cause of death among children between the ages of 1 and 15 years. In fact, they kill almost as many as all other causes of death combined (Chart 2).

During 1952, 180 Kansas children 14 years of age and under were killed in accidents of all types. Seventy-seven of these occurred in the home, 59 in motor vehicles, and the balance in a variety of other places.

In reviewing the major classifications of fatal home accidents among children 0 to 14 years (Chart 3), it is quite apparent that in the pre-school years most of them occur in or about the home and, as we would expect, as the child grows older, motor vehicle and public accidents become more common. Note the various types of fatal accidents in the home with relation to age groups as shown in Table I.

Little information is available on the non-fatal accident problem in Kansas. National estimates indicate, in the case of home accidents, that for every fatal accident we can expect at least 150 non-fatal injuries serious enough to incapacitate the individual for at least 24 hours. Based on national estimates, we can also expect four accidents resulting in a permanent disability for each fatal home accident reported. Thus, we could expect that during 1952, about 11,500 Kansas children less than 15 years of age were so severely injured by accidents in their homes that they were unable to play normally for at least 24 hours, and that 300 of these injuries resulted in a permanent disability. Add to this the serious injuries and disabilities resulting from motor vehicle and other types of accidents, and the number takes on startling proportions.

ACTIVITIES OF MEMBERS

Dr. James B. Weaver, University of Kansas Medical Center, was elected president of a newly formed six-state orthopedic group to serve Arkansas, Colorado, Kansas, Missouri, Nebraska, and Oklahoma. Dr. H. O. Anderson, Wichita, was named secretary-treasurer.

Dr. Franklin D. Murphy, chancellor of the University of Kansas, was principal speaker at a luncheon meeting of the Kansas Council of Women in Topeka on January 27. His subject was "Together We Progress."

Dr. C. F. Taylor, superintendent of the Norton Tuberculosis sanatorium, has joined the staff of the Larned State Hospital as a consultant. He will make weekly visits to the hospital.

Dr. Frederick S. Brenneman, Moundridge, has been granted a two-year leave of absence from the Harvey County Medical Society to work overseas with the Mennonite mission.

Dr. Robert A. Jordan, who has been practicing in Lawrence, has joined the staff of the University of Kansas Medical Center as an assistant professor in the Department of Internal Medicine.

Dr. L. S. Nelson, Salina, addressed a meeting of licensed practical nurses in District Five at a meeting held in Salina recently.

Dr. M. J. Cox, director of the Ford County Tumor Clinic, addressed the Parent-Teacher Association of Ashland on January 25. He spoke on the subject of cancer and showed two films, "The Doctor Speaks" and "The Warning Shadow."

Dr. Spencer Fast, Atchison, has been appointed part time public health director for the city and county of Atchison.

Dr. Ralph E. White, Garnett, addressed the Rotary Club in that city recently on the subject of diets, energy needs, and obesity.

Dr. William J. Reals, Wichita, is the author of a paper, "Protein-Bound Iodine Determinations in a Military Hospital," published in the December issue of *Military Surgeon.*

Dr. Edward D. Greenwood, Topeka, spoke on "Early Adolescent Adjustment" at Roosevelt Junior High School, Topeka, at a February Parent-Teacher Association meeting.

Dr. W. Clarke Wescoe, dean of the University of Kansas School of Medicine, was guest speaker at the annual health education program sponsored by the Woman's Auxiliary to the Wyandotte County Medical Society.

Dr. H. R. Wagenblast has been appointed assistant director for preventable diseases in the city-county health department in Wichita.

Dr. James L. Diacon and Dr. James L. McGovern, Wellington, have announced that they will soon open an office in Argonia.

Dr. Lewis L. Robbins of the Menninger Foundation, Topeka, was a speaker at the banquet program of the Shawnee County Association for Mental Health, Topeka, on February 2.

Dr. Charles A. Campbell, who has been practicing in Bucklin, has announced plans to begin practice soon at the Health Center, Phillipsburg.

Dr. Willard J. Kiser, Wichita, presented a paper, "Surgical Management of Ulcerative Colitis," before a regional meeting of the International College of Surgeons in Oklahoma City on January 23.

Dr. William Nice, who was recently released from the Army after serving two years at Camp Carson, Colorado, has opened an office in Topeka for the practice of internal medicine and pediatrics.

Dr. Philip W. Morgan, Emporia, spoke on "Teamwork Between Physicians and Nurses" before a recent meeting of the Lyon County Licensed Practical Nurses Association.

Dr. Bernard H. Hall, of the Menninger Foundation, addressed the Highland Park Optimist Club, February 4, on the subject of early treatment for the mentally ill.

Dr. Francis T. Collins, president of the Shawnee County Society, addressed the Shawnee County Medical Assistants' Society at a meeting held February 8 in Topeka. He outlined the work of a liaison committee he had recently appointed to bring about cooperation of the two groups in mutual projects.

Dr. Noble E. Melencamp, Dodge City, was elected "Man of 1954" by the Sigma Phi Epsilon fraternity at Kansas University. The title is awarded annually to the father of one member of the fraternity.

Dr. E. Burke Scagnelli, Dodge City, gave a talk on socialized medicine to the Knights of Columbus at a meeting held in Jetmore, January 31.

Dr. V. J. Vaughn, who has practiced in Axtell for five years, has announced that he will close his office to begin a residency in anesthesiology at Iowa University on April 1.

Dr. Harold H. Jones, Jr., and Dr. Roscoe Morton have been named part-time directors for the Winfield and Arkansas City offices of the Cowley County Health Department. They will serve until a full time director is named.

Capt. Donald W. Selzer, formerly of Manhattan, is now stationed at Fort Riley. He expects to be released from service in April and will begin a surgical residency at the Mayo Clinic in the fall.

Dr. Almonta D. Hays, Cherokee, has found it necessary to discontinue practice because of illness. Dr. M. F. Stock, Weir, will spend two afternoons each week in Cherokee to care for patients of Dr. Hays.

A tribute to Dr. and Mrs. Claire Hays, Cedar Vale, was published as an editorial in the *Cedar Vale Messenger* on February 4. They were credited with carrying forward the plan for a hospital in the city, and the new institution was opened on February 7.

Dr. Orville S. Walters, Topeka, spoke on "A Doctor Thinks About Religion" before a young people's group at the Seward Avenue Baptist Church in Topeka on February 21.

Dr. Daniel W. Melton, Preston, was honored by the community at a covered dish dinner held at the Preston High School on February 17. He has practiced there for 47 years.

Dr. Mary T. Glassen, Phillipsburg, was guest speaker at a meeting of the City Teachers' Association at Concordia on February 16.

Three Independence physicians, Dr. Porter M. Clark, Dr. Gerald C. Bates, and Dr. Harold O. Bullock formed a panel for the first free community medical forum held in Independence under the sponsorship of the Rotary Club there. Dr. Clark spoke on "Your Heart and You," and the others answered medical questions from the floor.

Cost of Medical Education

Medical college training in America costs approximately $9,200 today, according to a survey made recently for the *Journal of Medical Education*. The figures were based on questionnaires sent to students at 26 medical schools throughout the country.

The $9,200 does not cover the cost of premedical training, internship, and residency training, or the cost to the young physician of setting himself up in practice.

One-third of the 6,251 students who answered expect to be in debt when they graduate from medical school, and the amount of debt averages approximately $3,500. About half of the students are single and live away from home. Most of the money for education for the single student comes from his parents, while the married student is supported largely by the earnings of his wife. Income of all students varies widely, with an average of $2,450.

DEATH NOTICES

James Albert Settle, M.D.

Dr. J. A. Settle, 84, an honorary member of the Crawford County Society who had been living in Hutchinson since his retirement in 1949, died there on January 23. He received his education at the University of Tennessee and the University Medical College of Kansas City, winning his medical degree in 1893. His 56 years of practice were spent in the southeastern part of Kansas, 25 years in Walnut. During World War I, he was a captain in the Army Medical Corps, serving at Fort Riley. He had served as secretary and as president of his county society during his years of active practice.

Amendments to Constitution and By-Laws

In accordance with provisions of the constitution of the Kansas Medical Society, the Committee on Constitution and Rules now presents all amendments which have been suggested during the past year. These amendments will be discussed and voted upon at the meetings of the House of Delegates on May 4 and 6, 1954, in Topeka.

Numbers 1 and 2 relate to one subject:

1. Resolved: That the Constitution, Article VI, Section 1, be amended after the word "Society" by inserting a comma and the words "Chairman of the Editorial Board."

ARTICLE VI—COUNCIL

Section 1. The Council shall consist of one Councilor from each councilor district, and in addition the officers of the Society, CHAIRMAN OF THE EDITORIAL BOARD and the delegates to the American Medical Association as ex-officio members.

2. Resolved: That the Constitution, Article VII, Section 1, be amended after the word "councilors," by inserting the words "Chairman of the Editorial Board."

ARTICLE VII—HOUSE OF DELEGATES

Section 1. The House of Delegates shall be the primary legislative and governing body of this Society, and shall consist of the duly elected delegates, and the officers, councilors, CHAIRMAN OF THE EDITORIAL BOARD and past presidents of this Society.

COMMENT: Amendments No. 1 and No. 2 were read at the 1953 meeting and should be voted upon at the 1954 meeting. Their purpose, as explained last year, is to make the Chairman of the Editorial Board an official member of the Council and of the House of Delegates.

The committee recommends that resolutions 1 and 2 be adopted.

Numbers 3, 4, and 5 relate to one subject:

3. Resolved: That the Constitution, Article IV, Section 2, be amended by deleting the words "a second vice-president."

ARTICLE IV—COMPOSITION OF THIS SOCIETY

Section 2. The officers of this Society shall be a president, a president-elect, a first vice-president, [a second vice-president,] a secretary and a treasurer. All officers shall be elected by the House of Delegates of this Society for terms of office as are hereinafter provided.

4. Resolved: That the By-Laws, Chapter VI, Section 1, as amended in 1953, be further amended by deleting the words "First Vice-President," and by deleting the word "Two" and substituting therefore the word "THREE," and by deleting the word "Second" in the next line and substituting therefore the word "FIRST."

CHAPTER VI—ELECTION OF OFFICERS

Section 1. . . . the Committee shall meet not later than 90 days prior to the next annual session and present for publication in the Journal a list of candidates for each elective office, consisting of one or more candidates for the offices of President-Elect, [First Vice-President,] Secretary, Treasurer, and Delegate-Elect to the American Medical Association, and [two] THREE or more candidates for the offices of [Second] FIRST Vice-President and Alternate Delegate to the American Medical Association. . . .

The remainder of this section is not applicable to this amendment so is not reprinted here.

5. Resolved: That the By-Laws, Chapter VII, Section 4, be deleted and that the following sections be appropriately renumbered.

CHAPTER VII—DUTIES OF OFFICERS

[Section 4. The second vice-president shall also assist the president in the performance of his duties and in the event of the death, resignation, or removal of the first vice-president, shall succeed to that office for the remainder of the term.]

COMMENT: The Shawnee County delegation presented two resolutions at the 1953 session dealing with the officers of the Society and their election. Deleting the "Whereases" they were as follows:

(1). *Resolved* that the office of Second Vice-President be abolished, and *Resolved* that the vacancy on the Council, by abolishing the second vice-president, be filled by the Editor of the Journal.

(2). *Resolved* that a minimum of three names be offered as candidates for the office of First vice-president with a provision to permit nominations from the floor.

The first of these would require a constitutional amendment, and, being presented at one meeting, should be voted upon at the succeeding session. It would also require By-Laws changes. Since portions of these Shawnee County amendments are already incorporated in Constitutional amendments No. 1 and No. 2, we consider that amendments 3, 4 and 5,

Clinical Results* with Banthine® Bromide

(Brand of Methantheline Bromide)

22 Published Reports Covering Treatment of 1443 Peptic Ulcer Patients with Banthine

Comprising the reports published in the literature to date which give specific facts and figures of the results of treatment

AUTHORS	No. of Patients	Chronic, Resistant to Other Therapy	TYPES OF ULCERS				RELIEF OF SYMPTOMS (Chiefly Pain)				Surgery or Complications[1]	Side Effects Requiring Discontinuance of Drug[2]	EVIDENCE OF HEALING			
			Duodenal	Jejunal	Stomal	Gastric	Good	Fair	Poor	No Report			Complete	Moderate	None	No Report
Grimson, Lyons, Reeves	100	100	93	7			80	11	4		5		47		19	29
Friedman	15	15	14			1	5		4	6[3]			2			13
Bechgaard, Nielsen, Bang, Gruelund, Tobiassen	26	26	21			5	16	4	6				8	6	12	
McHardy, Browne, Edwards, Marek, Ward	162		162				136	12	11		3	1	14	9	7	129
Segal, Friedman, Watson	34	34	34[4]				14	13			7	2	5		8	14
Brown, Collins	117	99	117				97	7	8		5	8	55	9	8	40
Asher	77		65		7	5	52	9	16			16		9	21	47
Rodriguez de la Vega, Reyes Diaz	5	4	5				4		1					3	2	
Winkelstein	116	116	102	8		6	102		14				53		18	45
Hall, Hornisher, Weeks	18	18	18				11		1	6[3]			18			
Maier, Meili	38	38	24			14[4]	27	7	4[7]				10	2	5	21
Meyer, Jarman	25	18	25				21		4							25
Poth, Fromm	37	37	37				33	3	1				33	3	1	
Plummer, Burke, Williams	41	41	41				36		5				38		3	
McDonough, O'Neil	104	100	104				63	10	31			11	4		11	89
Broders	60	60	58		1	1	35	19	6				10	1	49[8]	
Legerton, Texter, Ruffin	11		11				11									11
Holoubek, Holoubek, Langford	76	69	76				35	27	10		4	10	26		10	36
Ogborn	42		39	2		1	42[9]									42
Shaiken	48	48	48				33	10	3		2		33	10	3	
Johnston	145	145	145				143		2			2	143		2	
Rossett, Knox, Stephenson	146		141			5	146					4[10]	53			93
TOTALS	1443	968	1380	17	8	38	1142	132	131	12	26	54	552	52	179	634
PERCENTAGES		67.8	95.6	1.2	0.6	2.6	81.3	9.4	9.3			3.7	70.5	6.6	22.9	

1. Not included in tabulations.
2. Included in "Relief of Symptoms" as "Poor" and in "Evidence of Healing" as "None."
3. Four had no symptoms when Banthine therapy was begun.
4. Of which seven were penetrative lesions and five partially obstructive.
5. No symptoms were present in four.
6. Two with symptoms only; no demonstrable ulcer.
7. Three were psychopathic patients and one had a ventricular ulcer of the lesser curvature.
8. Roentgen findings after treatment period of two weeks; forty-seven had duodenal deformity.
9. All returned to work within a week.
10. In these four, after relief of symptoms, Banthine was discontinued because of urinary retention.

During the past three years, more than 250 references to Banthine therapy in peptic ulcer and other parasympathotonic conditions have appeared in medical literature. Of these reports, 22 have presented specific facts and figures on the results of treatment in a total of 1,443 peptic ulcer patients, 67.8 per cent of whom were reported as chronic or resistant to other therapy. These results are tabulated above and show:

"Good" relief of symptoms was obtained in 81.3 per cent of the 1,405 patients on whom reports were available.

"Complete" evidence of healing was obtained in 70.5 per cent of the 783 patients on whom reports were available.

In all but 9.3 per cent, relief of pain was "good" or "fair." In all but 22.9 per cent, evidence of healing was "complete" or "moderate."

During treatment, 26 patients required surgery or developed complications other than ulcer which required discontinuance of the drug before results could be evaluated.

Of the remaining 1,417 patients, only 3.7 per cent experienced side effects sufficiently annoying to require discontinuance of the drug.

*Volume containing complete references, with abstracts of 39 additional reports, will be furnished on request by

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if passed, will make the wishes of the delegates from Shawnee prevail.

The Committee recommends that the office of second vice-president NOT be abolished, but favors the requirement that three or more candidates be nominated for the offices of second vice-president and Delegate-Elect to the American Medical Association. Therefore, the committee recommends that amendments 3 and 5 NOT pass and that amendment 4 be altered to include only the substitution of the word "three" for the word "two."

Numbers 6 and 7 relate to one subject:

6. Resolved: That the By-Laws, Chapter XII, Section 7 be amended by inserting a period after the word "Council" and deleting the remainder of that section.

CHAPTER XII—COMPONENT SOCIETIES

Section 7. Any physician who may feel aggrieved by the action of the component society of his county in refusing him membership, or in suspending or expelling him, shall have the right to appeal to the Council. [whose decision shall be final as to whether or not the appellant shall hold membership in this Society.]

COMMENT: Present wording of this section would appear to negate the time-honored right of each component society to be the absolute judge of its membership. The above deletion would still reserve the right of appeal to a censored or rejected member and would allow the Council to make recommendations to the component society.

7. Resolved: That the By-Laws, Chapter XII, Section 8 be amended by inserting after the word "compromise" the following: "Shall be the responsibility or duty of the Councilor of that district, and . . ."

CHAPTER XII—COMPONENT SOCIETIES

Section 8. In hearings of appeals, the Council may admit oral or written evidence as in its judgment will best and most fairly present the facts, but in every case of appeal efforts for conciliation and compromise SHALL BE THE RESPONSIBILITY OR DUTY OF THE COUNCILOR OF THAT DISTRICT, AND shall precede all hearings.

COMMENT: This would emphasize the fact that efforts for conciliation or compromise should be made through the efforts of the councilor of the affected district.

The committee recommends the passage of amendments 6 and 7.

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8. Resolved: That the By-Laws, Chapter XI, Section 7 be amended by inserting after the words "Executive Committee" the phrase, "who shall determine that the anticipated expenses of the meeting are within the budget."

CHAPTER XI—COMMITTEES

Section 7. The Committee on Arrangements . . . shall prepare and arrange for diversified scientific programs subject to the approval of the Executive Committee WHO SHALL DETERMINE THAT THE ANTICIPATED EXPENSES OF THE MEETING ARE WITHIN THE BUDGET and shall have general charge of all the annual session arrangements. . . .

The remainder of the section does not apply to this resolution.

COMMENT: This amendment was suggested in order that under no circumstances can the arrangements committee plan for and carry on a program for a meeting whose cost will be in excess of available funds of the Society.

The committee approves the adoption of this resolution.

Numbers 9 and 10 relate to one subject:

9. Resolved: That the By-Laws, Chapter IX, Section 1 be amended by deleting the entire section after the word "defense" in line 11 and substituting the words "To assist such member in planning for defense and IF REQUESTED by the defendant and deemed advisable by the Defense Board procure the services of an attorney approved by The Kansas Medical Society, provided the entire cost of such services shall be paid by the defendant. The Society shall not be obligated to pay ANY fees for legal services, nor any costs or judgments arising out of any action involving the professional services of any member."

CHAPTER IX—DEFENSE BOARD

Section 1. Members of The Kansas Medical Society are urged to carry individual professional insurance with commercial companies as these usually include possible indemnity in their policies, but additional assistance of the Society Defense Counsel may be provided if necessary or desired. It shall be the duties of the members of the Defense Board, severally or collectively, to investigate all claims of malpractice made against members desiring Society assistance; to assist in conducting the defense; [and to pay the Society defense attorney his fee and expenses from funds of this Society within their control, but they shall not pay or obligate this Society to pay any court costs or judgments rendered against any member in the final determination of any case, nor shall they be obligated without affirmative action, to pay

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and allied disorders

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Gouty Arthritis — Rheumatoid Arthritis
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Painful Shoulder (including peritendinitis, capsulitis, bursitis, and acute arthritis)

Since BUTAZOLIDIN is a potent agent, patients for therapy should be selected with care; dosage should be judiciously controlled; and the patient should be regularly observed so that treatment may be discontinued at the first sign of toxic reaction.

Physicians unfamiliar with the use of BUTAZOLIDIN are urged to send for complete descriptive literature before employing it.

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the fees of any local attorney employed by the member. The Defense Board shall be empowered to contract with agents or attorneys as it deems necessary, insofar as the amounts to be expended thereby are approved, or do not exceed the amount of the annual budget for defense purposes.] TO ASSIST SUCH MEMBER IN PLANNING FOR DEFENSE AND IF REQUESTED BY THE DEFENDANT AND DEEMED ADVISABLE BY THE DEFENSE BOARD PROCURE THE SERVICES OF AN ATTORNEY APPROVED BY THE KANSAS MEDICAL SOCIETY, PROVIDED THE ENTIRE COST OF SUCH SERVICES SHALL BE PAID BY THE DEFENDANT. THE SOCIETY SHALL NOT BE OBLIGATED TO PAY ANY FEES FOR LEGAL SERVICES, NOR ANY COSTS OR JUDGMENTS ARISING OUT OF ANY ACTION INVOLVING THE PROFESSIONAL SERVICES OF ANY MEMBER.

10. Resolved: That the By-Laws, Chapter IX, Section 6 be amended by deleting the first two sentences and substituting therefore "Section 6. Disbursements for defense to include reimbursement for any actual expenses incident to travel, by members of the Defense Board, required in the performance of official duties, and a per diem sum fixed by the Council for the days actually spent in such official duties may be allowed."

CHAPTER IX—DEFENSE BOARD

Section 6. [Disbursements foı defense shall be annually estimated in advance by the Defense Board as based upon average expenses of the preceding two years. The computed amount shall then be included in the annual budget of the Executive Secretary for presentation to and approval by the House of Delegates.] DISBURSEMENTS, FOR DEFENSE TO INCLUDE REIMBURSEMENT FOR ANY ACTUAL EXPENSES INCIDENT TO TRAVEL, BY MEMBERS OF THE DEFENSE BOARD, REQUIRED IN THE PERFORMANCE OF OFFICIAL DUTIES, AND A PER DIEM SUM FIXED BY THE COUNCIL FOR THE DAYS ACTUALLY SPENT IN SUCH OFFICIAL DUTIES MAY BE ALLOWED.

The remainder of the section will remain but has no bearing upon the amendment so is not reprinted here.

COMMENT: These two amendments were prepared at the request of the Council. Reasons for this change from the original plan of providing services of the attorney for the Society when requested can best be explained by them.

The committee recommends adoption of these two amendments.

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11. Resolved: That the By-Laws, Chapter II, Section 1 be amended by striking out the words "Twenty-five" and substituting the word "Fifty."

CHAPTER II—ASSESSMENTS

Section 1. The amount of the annual assessment for The Kansas Medical Society only shall be not more than [twenty-five] FIFTY dollars per member, the exact amount to be determined by the Council after consideration of the annual budget for the ensuing year and to be announced to the various component societies not less than three months before the beginning of each fiscal year. . . .

The remainder of this section has no bearing on this amendment.

COMMENT: Increased activities and increased costs generally have made expenses exceed the income for the past few years. Rather than delve into reserve funds established years ago, this increase of dues is recommended. While fifty dollars is set as a maximum, it is presumed that a lesser sum may be set by the Council annually.

The committee recommends adoption of this resolution.

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12. Resolved: That the By-Laws, Chapter I, Section 4 be amended by deleting the last sentence.

CHAPTER I—MEMBERSHIP

Section 4. . . . [Honorary members having qualifications required by the Constitution of the American Medical Association may be recommended for Affiliate Fellowship in the American Medical Association by vote of the House of Delegates.]

The preceding portion of this section has no bearing on this amendment.

COMMENT: Since fellowship classifications within the American Medical Association have been abolished, this sentence has been rendered inoperative.

The committee recommends adoption of this resolution.

Numbers 13 and 14 pertain to the same subject:

13. Resolved: That the By-Laws, Chapter XI, Section 1a, be amended by adding a new section 37 "Committee on General Practice Award."

14. Resolved: That the By-Laws, Chapter XI be amended by adding a section.

CHAPTER XI—COMMITTEES

SECTION 37. THE COMMITTEE ON GENERAL PRACTICE AWARD SHALL CONSIST OF FIVE OR MORE MEMBERS OF WHICH ONE SHALL BE A COUNCILOR AND ONE THE PRESIDENT OF THE KANSAS ACADEMY OF

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GENERAL PRACTICE OR A MEMBER OF THAT ACADEMY DESIGNATED BY HIM. TWO OR MORE MEMBERS SHALL HAVE SERVED ON THE RETIRING COMMITTEE. THE DUTIES OF THE COMMITTEE SHALL BE TO DETERMINE AN INDIVIDUAL MEMBER AND SUBMIT ADEQUATE MATERIAL AND INFORMATION IN SUPPORT OF ANY KANSAS MEDICAL SOCIETY MEMBER DESIRED TO BE SUBMITTED TO THE AMERICAN MEDICAL ASSOCIATION COMMITTEE AS A CANDIDATE FOR THE ANNUAL GENERAL PRACTITIONER'S AWARD.

COMMENT: This will establish a permanent mechanism whereby this Society may nominate, if it wishes to do so, a candidate for the American Medical Association award to the outstanding general practitioner of the year.

The committee recommends adoption of these resolutions.

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15. Resolved: That the By-Laws, Chapter VIII, Section 12, be amended by striking the word "Eleven" and substituting "a majority of the."

CHAPTER VIII—THE COUNCIL

Section 12. [Eleven] A MAJORITY OF THE members of the Council shall constitute a quorum.

COMMENT: This appears advisable to care for this question regardless of the number on the Council.

The committee recommends this be passed.

Numbers 16, 17, 18, and 19 refer to one subject:

COMMENT: Revision of the Council districts in an effort to produce a more equitable distribution of members within the several districts has been a project with which your committee has worked during this past year. The following four plans appear feasible.

The committee recommends that the House of Delegates select its preference from these four alternatives:

Number 16 retains 12 council districts.

Number 17 creates 15 council districts.

Number 18 creates 14 council districts.

Number 19 creates 17 council districts.

16. Resolved: That the By-Laws, Chapter VIII, Section 13, enumerating the counties comprising the present Councilor Districts remain as at present except that Leavenworth County be removed from District 2 and placed into District 1.

CHAPTER VIII—THE COUNCIL

Section 13. The councilor districts shall be comprised of the following counties: First District: Marshall, Nemaha, Brown, Doniphan, Pottawatomie, Jackson, Atchison, [and] Jefferson AND LEAVENWORTH Counties. Second District: [Leavenworth,] Wyandotte, Douglas, Johnson, Franklin, Miami, Anderson and Linn Counties.

The remainder of this long section is not quoted because it remains as at present.

COMMENT: This will occasion no change in Councilor elections.

17. Resolved: That the By-Laws, Chapter VIII, Section 13 enumerating the present Councilor Districts shall retain their present boundaries except that Leavenworth County be placed into District 1 and that three new districts shall be formed whereby Wyandotte County shall be removed from District 2 and become District 13, Shawnee County shall be removed from District 4 and become District 14 and Sedgwick County shall be removed from District 6 and become District 15.

COMMENT: This will alter counties as currently listed in this section but because of its length is not reprinted here. Such action will not conflict with other sections of the Constitution and By-Laws and will require the election of five councilors each year for the future.

If this amendment is voted the following, in addition to the regular Councilor elections, will become necessary during this annual session.

a. District 4 (without Shawnee County) would elect a Councilor for a term expiring in 1957.

b. District 6 (without Sedgwick County) would elect a Councilor for a term expiring in 1956.

c. District 13 (Wyandotte County) would elect a Councilor for a term expiring in 1955.

18. Resolved: That the By-Laws, Chapter VIII, Section 13 be deleted after the word "counties" and the following be inserted:

District 1—Atchison, Brown, Doniphan, Jackson, Jefferson, Leavenworth and Nemaha.

District 2—Anderson, Douglas, Franklin, Johnson, Linn, Miami and Wyandotte.

District 3—Allen, Bourbon, Cherokee, Crawford, Labette, Montgomery, Neosho, Wilson and Woodson.

District 4—Clay, Geary, Marshall, Pottawatomie, Riley and Washington.

District 5—Chase, Coffey, Lyon, Morris, Osage, Shawnee and Wabaunsee.

District 6—Butler, Chautauqua, Cowley, Elk and Greenwood.

District 7—Cloud, Dickinson, Ellsworth, Jewell, Lincoln, Mitchell, Ottawa, Republic and Saline.

District 8—Harvey, McPherson, Marion, Reno and Rice.

District 9—Barber, Harper, Kingman, Sedgwick, and Sumner.

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District 10—Ellis, Graham, Osborne, Phillips, Rooks, Russell, Smith and Trego.

District 11—Barton, Hodgeman, Ness, Pawnee, Rush and Stafford.

District 12—Clark, Comanche, Edwards, Ford, Gray, Kiowa, Meade, Pratt and Seward.

District 13—Cheyenne, Decatur, Gove, Logan, Norton, Rawlins, Sheridan, Sherman, Thomas and Wallace.

District 14—Finney, Grant, Greeley, Hamilton, Haskell, Kearny, Lane, Morton, Scott, Stanton, Stevens and Wichita.

COMMENT: If this resolution is adopted, it is recommended that each present councilor retain his position until the expiration of his present term and that new councilors be elected in the newly formed districts, their terms to be staggered as indicated to insure proper rotation.

One conflict is created because two present councilors reside in the proposed District 12. It is recommended that both continue in their office for one year, at which time Doctor Klein will be ineligible for re-election because of having completed two successive terms. Then in 1956, when Doctor Black's second term expires, District 12 will elect a new councilor for a three-year term.

District	*Councilor*	*Term Expires*
1	W. L. Anderson, M.D., Atchison	1954
2	H. P. Jones, M.D., Lawrence	1954
3	Charles E. Vestle, M.D., Humboldt	1955
4	S. A. Anderson, M.D., Clay Center	1954
5	F. C. Taggart, M.D., Topeka	1956
6	NEW	1957
7	A. E. Rueb, M.D., Salina	1954
8	H. M. Glover, M.D., Newton	1956
9	N. L. Francis, M.D., Wichita	1955
10	L. W. Reynolds, M.D., Hays	1955
11	NEW	1955
12	C. V. Black, M.D., Pratt	1956
	R. G. Klein, M.D., Dodge City	1955
13	J. L. Jenson, M.D., Colby	1956
14	NEW	1956

19. Resolved: That the By-Laws, Chapter VIII, Section 13 be deleted after the word "counties" and the following be inserted:

District 1—Atchison, Brown, Doniphan, Jackson, Jefferson, Leavenworth and Nemaha.

District 2—Wyandotte County.

District 3—Anderson, Douglas, Franklin, Johnson, Linn and Miami.

District 4—Allen, Bourbon, Cherokee, Crawford, Labette, Montgomery, Neosho, Wilson and Woodson.

District 5—Clay, Geary, Marshall, Pottawatomie, Riley and Washington.

District 6—Shawnee County.

District 7—Chase, Coffey, Lyon, Morris, Osage and Wabaunsee.

District 8—Butler, Chautauqua, Cowley, Elk and Greenwood.

District 9—Cloud, Dickinson, Ellsworth, Jewell, Lincoln, Mitchell, Ottawa, Republic and Saline.

District 10—Harvey, McPherson, Marion, Reno and Rice.

District 11—Sedgwick County.

District 12—Barber, Harper, Kingman, Pratt and Sumner.

District 13—Ellis, Graham, Osborne, Phillips, Rooks, Russell, Smith and Trego.

District 14—Barton, Hodgeman, Ness, Pawnee, Rush and Stafford.

District 15—Clark, Comanche, Edwards, Ford, Gray, Kiowa, Meade and Seward.

District 16—Cheyenne, Decatur, Gove, Logan, Norton, Rawlins, Sheridan, Sherman, Thomas and Wallace.

District 17—Finney, Grant, Greeley, Hamilton, Haskell, Kearny, Lane, Morton, Scott, Stanton, Stevens and Wichita.

COMMENT: This varies from resolution No. 10 in the separation of the three large counties and in changing Pratt County.

If this resolution is adopted, the following situation would apply regarding Councilor elections at this session. No conflicts are created.

District	*Councilor*	*Term Expires*
1	W. L. Anderson, M.D., Atchison	1954
2	NEW	1955
3	H. P. Jones, M.D., Lawrence	1954
4	C. E. Vestle, M.D., Humboldt	1955
5	S. A. Anderson, M.D., Clay Center	1954
6	F. C. Taggart, M.D., Topeka	1956
7	NEW	1956
8	NEW	1957
9	A. E. Rueb, M.D., Salina	1954
10	H. M. Glover, M.D., Newton	1956
11	N. L. Francis, M.D., Wichita	1955
12	C. V. Black, M.D., Pratt	1956
13	L. W. Reynolds, M.D., Hays	1955
14	NEW	1955
15	R. G. Klein, M.D., Dodge City	1955
16	J. L. Jenson, M.D., Colby	1956
17	NEW	1957

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1. Sayer, R. J., et al.: Am. J. M. Sc. *221*:256 (Mar.) 1951.
2. Welch, H.: Ann. New York Acad. Sc. *53*:253 (Sept.) 1950.
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The Pathogenesis of Hypochromic Microcytic Anemia

David L. Zacharias, M.D.

Kansas City, Missouri

HISTORICAL

This history of hypochromic microcytic anemia, as such, extends back some 75 years, when Hayem first observed what we would now designate as a lowered color index in the anemia associated with chlorosis. In 1883 Laache showed that the proportion of hemoglobin to the number of red cells was of some importance in differentiating the anemias, and in 1885 Osler recognized that after severe hemorrhage the development of hemoglobin did not keep pace with the red cell formation.

Although Sydenham had found in 1661 that chlorosis was benefited by treatment with iron, no rational explanation was offered until 1746, when Menghinis discovered that this element was a characteristic part of the blood. Fodish demonstrated in 1832 that the iron content in the blood of chlorotics was greatly decreased, and in the same year Blaud announced the formula and dosage of an iron preparation which was effective in the treatment of chlorosis. There were some, however, who questioned the value of iron in the treatment of anemia even up to and past the turn of the present century, but since 1926, when Minot and Murphy demonstrated the value of liver in pernicious anemia, the value of iron as a specific remedy for certain anemias seems to have been permanently established.[1, 2, 3]

ETIOLOGY

That a hypochromic microcytic anemia can be produced by several deficiency states has been shown experimentally in the laboratory animal, but fortunately not all of these have been demonstrated in man. Such anemias have been observed in swine fed a diet lacking in pyrodoxine or pantothenic acid[4] and in rats kept deficient in copper,[5] and in 1935 Underwood and Filmer demonstrated that a deficiency of cobalt in grazing areas was ofttimes responsible for such a condition in cattle and sheep. Since deficiencies of pyrodoxine, pantothenic acid, or cobalt have never been demonstrated in man, and copper deficiency very rarely, the bulk of the hypochromic anemia seen clinically must be due to some other cause, which is, of course, a deficit in the amount of iron available for adequate erythrocyte production.

The anemia associated with chronic infection is most often of a normocytic normochromic type, but the cells may become pale and small after the condition has been present for some time.[6] Likewise, the anemia of sprue, while classically a macrocytic hyperchromic type, may in the later stages come to be hypochromic and microcytic. In all probability, the changed morphology of the red cells in the later stages of both of these states is due to a lack of iron being presented to the bone marrow for red cell production with a consequent over-shadowing of the original condition by iron deficiency.

The importance of iron deficiency can be demonstrated by noting that it is the most common clinically manifest deficiency state occurring in some institutions. It occurs most often in women during the child bearing age and at the menopause, in infants of either sex between the ages of 8 and 27 months,[7] and in adolescent girls with the combined requirments of rapid growth and the menses.[1] A hypochromic microcytic or iron deficiency anemia seldom occurs in the adult male without chronic blood loss, although it is sometimes seen in the adolescent. Even here it is far from common.

In order to explain the mechanism and typical group occurrence of this anemia, it will be necessary to review briefly the metabolism of iron. According to all available evidence, and volumes have been published during the past few decades, iron is one of the few substances which the human body has little ability to excrete through the ordinary channels. The amount lost by way of the intestinal tract has been estimated as approximately 0.3 to 0.5 milligram daily, and measurable amounts are lost through perspiration, desquamated epithelial cells, and from leucocytes discharged from the various body orifices.[8] Urinary loss has been measured in amounts ranging from 0.01 to 0.8 milligram per day, with the smaller figure probably representing the more accurate determination.[9] A small quantity is also used in hair growth, somewhat less than a milligram is lost daily in the milk of the lactating female[1] and approximately 15 to 35 milligrams are lost with each average menstrual flow.[10] Therefore, a relatively small amount of iron, in the neighborhood of ½ to 1 milligram daily, is

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This is one of 11 theses, written by fourth year students at the University of Kansas School of Medicine, selected for publication by the Editorial Board from a group judged to be the best by the faculty at the school.

Thesis written while the author was a fourth year student. Dr. Zacharias is now interning at St. Joseph Hospital, Kansas City, Missouri.

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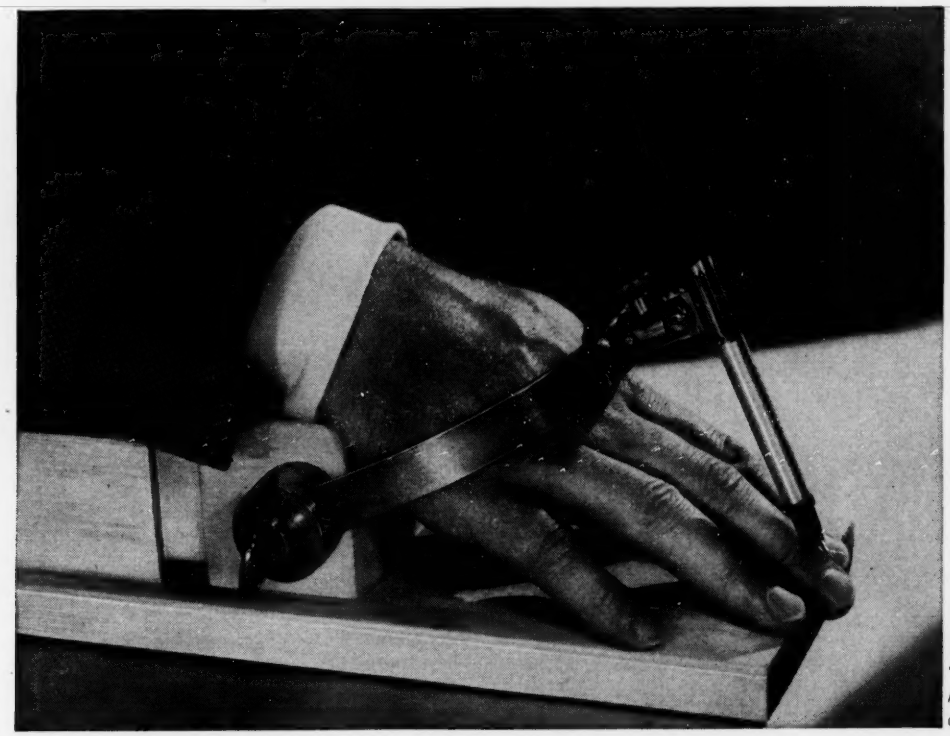

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1. English, A. R.; P'an, S. Y.; McBride, T. J.; Gardocki, J. F.; Van Halsema, G., and Wright, W. A.: Antibiotics Annual (1953-1954), New York, Medical Encyclopedia, Inc., 1953, p. 70.
2. Finland, M.: Brit. M. J. 2:4846 (Nov. 21) 1953.

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all that is necessary to maintain iron balance. Somewhat more is required in the female during periods of rapid growth, pregnancy, or heavy menstruation. The usual yearly requirements of iron for males and females, as determined by Heath and Patek, are listed in the table below.

YEARLY REQUIREMENTS OF IRON FOR MALES AND FEMALES

Age	*Annual Requirements Male in mg.*	*Annual Requirements Female in mg.*
Birth	0.195	0.182
1	0.112	0.112
2	0.080	0.092
3	0.092	0.080
4	0.098	0.087
5	0.079	0.106
6	0.080	0.078
7	0.070	0.067
8	0.072	0.108
9	0.152	0.120
10	0.130	0.163
11	0.137	0.164
12	0.189	0.192
13	0.198	0.145
14	0.314	0.468
15	0.313	0.424
16	0.353	0.498
17	0.183	0.435
18	0.149	0.452
19	0.081	0.365
20	0.071	0.358
21		0.298
22		0.298
23		0.298
24		0.374*
25		0.298

* Iron requirement for pregnancy.

In view of the low requirements necessary to meet physiological needs, an iron deficiency anemia in the adult must be considered as evidence of abnormal loss. The major losses are from hemorrhage and pregnancies. Once the body has attained adult size, it will not become deficient in iron except through one or both of these processes. The deficiency may be accelerated, however, by a poor dietary intake or by poor absorption from the intestinal tract.[8]

In studies of iron metabolism with radioactive isotopes of iron, it has been demonstrated that the ferrous form is absorbed much more readily than the ferric and that the absorption is normally a well-controlled process. Such a mechanism is necessary since the human body is apparently incapable of excreting iron in appreciable amounts, and body levels are ordinarily kept within rather constant limits. In the nondeficient person, only a small portion of the ingested food-iron is absorbed daily, while in the deficient patient the absorptive process is speeded up and is much more efficient. Normal persons may retain only 1 to 10 per cent of a single dose of radioactive iron, while those who are deficient may retain more than 20 per cent.[10] In children, the absorption closely parallels the need of the element, and the same is apparently true during the latter half of pregnancy when the fetal iron stores are being built up.[11]

Since iron is best absorbed in the ferrous state, any reducing substance in the gastrointestinal tract and any acid present are of importance. The acidity of the stomach serves two primary functions. The lowered pH converts colloidal ferric hydroxide normally found in foodstuffs into the molecular ferric ion, and in this acid medium other substances are capable of reducing the ferric ions to the ferrous form. The reducing agents include asorbic acid, cystiene, and the –SH groups of various proteins. Reduction will not occur if the pH is 7 or above.

Iron absorption may be possible in nearly any part of the small bowel, but normally little is taken in except in the duodenal region. Since the reaction here is acid, the ferrous iron formed by reduction in the stomach is not readily oxidized to the ferric form, there is a higher concentration of ferrous ion present, and the absorption appears to be more efficient. As the iron moves on down the intestinal tract, the digestive juices of the pancreas, liver, and intestine tend to raise the pH, and much of the ferrous iron is auto-oxidized again to form ferric hydroxide. With the usual food intake of 2 to 10 milligrams of iron, absorption is probably limited to a very short segment below the pylorus, while with doses of ferrous iron a larger surface may be brought to play.[12] Even then, a maximum of about 15 milligrams is all that can be absorbed from a total dose of 300 milligrams of ferrous iron.

Since the human body appears incapable of excreting iron in any but minimal amounts, the mucosal cells must be capable of limiting absorption by a one-way transfer of iron into themselves. In the normal person there is ordinarily a resistance to the uptake of iron, since absorption can be increased 5 to 20 times in the deficiency state. This limitation is apparently set up within the mucosal cell through the apoferratin-ferratin mechanism.

The present hypothesis is that ferrous iron is taken into the mucosal cell where it is oxidized to the ferric state and incorporated into the protein apoferratin, which is capable of taking up 23 per cent of its own weight of iron and is then designated as ferratin. In order to enter the blood stream, the ferric iron is again split off and reduced to ferrous iron which can penetrate the mucosal cell wall into the vessels. There it is again auto-oxidized to the ferric state and attached to a globulin, siderophilin, for transport. It has been postulated that in the deficiency state the content of apoferratin in the mucosal cells is increased, thereby accounting for the more efficient uptake of iron, and the lesser amount in the average normal cell limits the intake to that required for the needs of the body —the so-called mucosal block.[12]

The absorption of oral doses of radioactive iron is reflected by an increase in the plasma iron in direct proportion to the size of the dose given. This holds true until the dose exceeds that of maximum absorption or until the motility of the gastrointestinal tract

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is interfered with. The normal range is usually stated to be somewhere between 80 and 180 micrograms per 100 cubic centimeters, but actually there is enough siderophylin present to combine with 300 to 400 micrograms of iron. The plasma level may reach these heights after parenteral iron is given, but it returns to normal within the course of a few hours.

Iron appears to be stored primarily in the liver, spleen, bone marrow, and kidneys, in the form of ferratin, although some probably exists in the form of hemosiderin and monomolecular hydroxides. It also forms an integral part of several enzymes and as such is not available for other uses.[10] Grancik's concept is that the iron available for erythropoiesis exists in two rather different states: the labile iron, composed of recently absorbed iron and that recently liberated from hemoglobin breakdown, and as the less readily available storage iron, composed of somewhat more complex polymers. This is borne out by the fact that the total dose of radioactive iron, given intravenously to deficient patients, appears within 10 days in the red cells. Apparently none is stored for future use nor is there any mixing of the parenteral iron with the already existent stores.[14, 15]

Copper is necessary for the incorporation of iron into protoporphyrin for the formation of the heme portion of hemoglobin. A deficiency may cause an anemia identical with that of iron deficiency. Fever of any origin has been shown to interfere with the utilization of iron, and lead poisoning is also capable of disrupting erythrocyte formation.[16]

The fetus apparently stores iron in the last trimester and may be born with inadequate supplies if the mother is deficient. This is especially true in the case of prematurity or multiple births. The mother's condition is usually not caused by the pregnancy but by factors antedating it, such as bleeding from any cause or repeated pregnancies. That younger siblings tend to develop more severe anemia than their older brothers or sisters has been shown in several families. Contrary to popular belief, a varied diet is not adequate to prevent or relieve anemia in an infant born with inadequate iron storage. Supplemental iron preparations are necessary.[7]

In the hypochromic microcytic anemia of pregnancy, the usual hemoglobin determinations are invalid, due to the rapidly changing plasma volume. The degree of anemia can be evaluated only by a study of the peripheral blood and a determination of the total red cell mass and plasma volume. This anemia is almost invariably present before gestation or very early in pregnancy and appears to be due to factors which were operating before conception occurred. Repeated pregnancies, with iron loss to the fetus and blood loss at the time of delivery, may lead to the development of an iron deficiency anemia, but the fetal uptake during the course of one pregnancy is insufficient to interfere with the maternal hemoglobin level.[17, 18]

The iron deficiency type of anemia sometimes seen in the adolescent female is ordinarily ascribed to the increased requirements which go along with rapid growth and menstruation. A few cases of hypochromic anemia in the adolescent male have been reported, none of which had a history of chronic blood loss but all of which had marked hypochlorhydria or achlorhydria. This suggests a connection between gastric deficiency and anemia.[19]

A hypochromic anemia in the adult can usually be identified with repeated pregnancies or with chronic blood loss. The latter may be due to any number of things, including menorrhagia, bleeding ulcers, bleeding hemorrhoids, abortion or miscarriage, hookworm or other parasites of the gastrointestinal tract, malignancy with bleeding, polyps of the gut, diaphragmatic hernia, or ulcerative colitis. Menopausal menorrhagia is a not uncommon factor in middle aged females.

SYMPTOMATOLOGY

The symptoms of hypochromic anemia are insidious in their onset, and many of the complaints consist of weakness, dyspnea on exertion, easy fatigability, pallor, palpitation, and a feeling of dead tiredness. Rarely, a patient will complain of dysphagia. Pallor of the skin, mucus membranes, and nail beds is in proportion to the reduction of hemoglobin; spoon nails with longitudinal ridging may be present, and an occasional patient may have cheilosis. Hemic murmurs may be present, and in more severe cases there may be edema, anginal symptoms, cardiac enlargement, and electrocardiographic changes. Cheilosis or other oral signs are probably due to a co-existent vitamin deficiency, usually of the B group, and the degree and type of deficiency does not detectably interfere with iron absorption or utilization.[10, 11, 20]

The lower limit of normal hemoglobin levels is somewhat uncertain but is usually considered to be approximately 11.5 grams per cent for the adult white female, 12 grams per cent for the adult white male, and 11 grams per cent for children under the age of 12 years. The values in Negroes may be slightly lower. However, persons with hemoglobin values at or slightly below these levels are not necessarily anemic and may fail to respond to therapy. In the diagnosis of hypochromic anemia, a low hemoglobin is not sufficient; the red cells must also show a mean corpuscular volume of 80 cubic microns or below, and the mean corpuscular hemoglobin concentration must be below 30 per cent. Serum iron determinations are useful in some cases but are not generally available or necessary in the routine case.[10, 11]

50 *and seven*

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TREATMENT

Once the diagnosis of iron deficiency anemia is established, the treatment consists simply of the administration of a suitable iron preparation. This should probably consist of a ferrous salt of iron, since it appears that this form is more effective, and could be of either ferrous sulfate, gluconate, chloride, or carbonate. The usual dosage consists of 5 grains of any of these compounds 4 times daily. Larger doses may sometimes cause gastrointestinal discomfort, and massive overdoses have been known to cause acute hemorrhagic gastritis and liver damage.[10, 11]

The use of intravenous saccharated iron oxide has recently received much publicity but appears to be no more effective in the treatment of hypochromic anemia than are the oral preparations. Possible indications for its use include cases with extensive bowel resection, those receiving deep radiation therapy, and perhaps in some cases of severe anemia late in pregnancy when a rapid repletion of the iron stores is desirable.

Toxic reactions to saccharated iron oxide do occasionally occur and may be of a localized or general nature. The former results from extravasation of the solution into the tissues and consists of local pain, perhaps followed by a local thrombophlebitis. Generalized symptoms vary considerably but may include flushing, syncope, headache, substernal distress, shortness of breath, epigastric distress followed by a temperature elevation, hypertension, or tachycardia. Experience indicates that the preparation is safe and relatively non-toxic, but further clinical evaluation is needed. Overdosage may conceivably result in excessive iron deposition with resultant tissue damage.[17, 21, 22]

SUMMARY

Although several factors may be responsible for the production of a hypochromic microcytic anemia, the most important is that of iron deficiency. This is so prominent that some authors consider it as an almost specific etiologic agent. A brief review of the metabolism of iron has been given in an attempt to explain the prevalence and mode of production of this anemia in the different age groups. The symptomatology and treatment have also been mentioned.

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ANNOUNCEMENTS

A regional meeting of the Central Region of the National Gastroenterological Association will be held in Milwaukee on March 28. Scientific sessions will be held at the Hotel Schroeder following the semi-annual meeting of the organization's council. Programs may be obtained from Dr. Joseph Shaiken, 536 West Wisconsin Avenue, Milwaukee 3, Wisconsin.

The Third Annual Seminar and Conference on Cancer Cytology will be held by the Cancer Institute at Miami, Florida, April 21-24. Information may be obtained from Cancer Research and Cytology Center, 1155 N.W. 14th Street, Miami, Florida.

The Fifth Annual Dr. F. G. Thompson, Sr., Lectureship will be presented at 902 Edmond Street, St. Joseph, Missouri, on Thursday, May 20, by Dr. Robert M. Moore, professor of surgery, University of Texas. Information may be secured from Thompson, Brumm and Knepper Clinic, St. Joseph, Missouri.

A meeting of the American Geriatrics Society will be held at the Fairmont Hotel, San Francisco, just preceding the meeting of the A.M.A. Scientific ses-

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*Stead, E. A., Jr., in Cecil, R. L., and Loeb, R. F.: Textbook of Medicine, ed. 8, Philadelphia, W. B. Saunders Co., 1951, p. 1065.

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sions will begin on June 17 and continue through June 19. The meeting will be open to all physicians interested in the field of geriatrics. Details may be secured from W. O. Thompson, M.D., 700 North Michigan Avenue, Chicago 11, Illinois.

The Third Annual Symposium on Tuberculosis and Other Chronic Pulmonary Diseases for General Practitioners will be held in Saranac Lake, New York, July 12-16. The course is approved by the American Academy of General Practice for 26 hours of credit. Programs and complete information may be secured from Chest Disease Symposium, P. O. Box 2, Saranac Lake, New York.

A select list of medical films available only to professional audiences may now be obtained free of charge upon request to the Princeton Film Center, Inc., Princeton, New Jersey. All are 16 mm. films, some silent, some with sound, many in color.

THE KANSAS PRESS LOOKS AT MEDICINE

Editor's Note. In this section the JOURNAL *reproduces editorials relating to medicine which have appeared in the lay press. An effort is made to include both favorable and unfavorable comments, and the Editorial Board in no instance assumes responsibility for the opinions expressed.*

On the Spot

Congressmen seem to be worried for fear President Eisenhower will in some way jeopardize their chances in the coming off-year election. And I think he may do just that, but not in the way they mean.

They are especially worried about his farm program and his health program. They are worried because he does not see fit to woo the pressure groups. And well they may be. But not because the pressure groups are so frightfully important. The danger to Congressmen who are up for election will come from the fact that Eisenhower's middle-of-the-road stand may put them on the spot and show their stripes to the voters.

For instance, Eisenhower's health program, like his farm program, was not cut to the measure of any pressure group. It was not designed to please the American Medical association nor yet the rafts of chronic dependents who bleed the country white in their demands for constant medical attention, some of it necessary and some of it not.

The President's proposal to underwrite voluntary health insurance groups was cut to the measure of the millions of small taxpayers who have contributed more than their share toward the nation's gigantic health relief bill and are still not wealthy enough to meet their own medical expenses without cruel hardship and sometimes bankruptcy. Already the American Medical association has expressed its displeasure over Eisenhower's proposal. But it has offered no substitute to that or to the bromide that the rich can pay their own bills and the poor can be taken care of.

Very soon our Congressmen will have an opportunity to vote for bills growing out of the chief executive's recommendation. If they vote against it they will please both the Medical Association and the organized reliefers. But they will infuriate hundreds of thousands of middle-class voters. And it was these voters, independents for the most part, who elected Eisenhower and who got many Congressmen into office on his shirt tails.

There are growing indications that Eisenhower proposes to fulfill his promise to serve as President of all Americans. Now the rank-and-file Americans have needed a President for a long time. If they see one in Eisenhower they will hang on to him. There is a possibility that Congressmen who thwart Eisenhower's efforts to serve the middle-class may get themselves licked to a finish without for a moment diminishing his popularity.—*Marion Ellet in Concordia Blade-Empire, January 23, 1954.*

Program of Kansas Council of Women

The Kansas Council of Women, in its proposed program of work for 1954, lists 18 objectives, three of which pertain to subjects of interest to the medical profession.

The first of the three is to "Continue participation in and support of statewide programs that encourage and strengthen protective health measures, safeguarding at all times state and local control of the programs."

Next is listed the support of legislation that will "(a) Continue to provide sufficient funds for adequate care and treatment of the mentally ill, and for training personnel; (b) improve commitment laws."

The third project pertains to work being carried on for psychotic, exceptional, and handicapped children, in addition to those living in Kansas institutions, and directs that the Kansas Council of Women co-operate with other recognized organizations to improve all forms of therapy and assistance.

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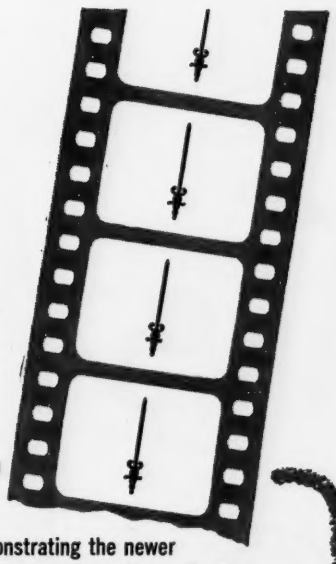

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BOOK REVIEWS

The Psychiatrist, His Training and Development, Report of the 1952 Conference on Psychiatric Education of the American Psychiatric Association and the Association of American Medical Colleges, June 19-25, 1952. Published by American Psychiatric Association, Washington 1, D. C., 1953. Pp. 214.

The focus of the study was primarily on the training of career psychiatrists, complementing the previous year's conference on psychiatry in undergraduate medical education, both of which were financed by the United States Public Health Institute. The purpose was the teaching of basic and clinical psychiatry and the coordinating of groups concerned with the problems of the use of total resources for the promotion and preservation of the emotional health of the community.

This book is a valuable historical document of current practices in residency training with well organized expression of opinions on their value and the reasons therefor. The transition from 1951 is logical and suggestive of the steps to come in the next edition. The scope of psychiatry is broadly considered both clinically and communally.

There is clear-cut recognition that the older eclectic methods of teaching are fast waning. In fact, the lecture method has given way to case demonstrations, group discussions, and to the almost universal method of personal supervision and individual teaching of each resident—the present method of choice.

The central theme of the informal discussion rested upon concern with the psychodynamic aspects of psychiatry. The development of a psychiatrist requires an understanding of personality in terms of psychodynamic concepts, requiring considerable time and effort in prolonged work with individual patients, far more than to gain adequate proficiency in many other aspects. What is taught as psychodynamics varies greatly in various centers. Hence, this conference attempted to lay dawn basic principles which were commonly believed to come in this category. (See Chapter 2.) In some centers it is merely neurology which is taught. In others, it is psychoanalytically oriented from the first day of residency.

The editors quote from Maxwell Gitelson, who wrote, "The chief contribution of psychoanalysis to American psychiatry has been to complete the structure which was originally given it by psychobiology. Without the concept of the unconscious and the things which follow from that concept, the 'sense and meaning' which Adolph Meyer observed in mental illness remained without system and unity. With this concept, psychiatry really has become holistic."

Between these points of view of teaching, Thomas A. C. Rennie says in his section on the teaching of dynamic psychiatry, "Many residents are too prone to consider that psychodynamics constitute all of psychiatry and to pursue their training largely with the aim of that practice in mind, to the exclusion of real concern with broad general competence and dynamic understanding of the wide range of psychiatric disorders. The fundamental aim of the residency program should be the attainment of such competence and understanding; within this framework, psychodynamics and psychotherapy are the major tools."

Much of this book is devoted to how this last may be accomplished and what it is all about. As one reads, one senses the conflicts which seem to be the central theme of this present generation in civilization. While it is not so written in this book, it is obvious that the discussors are well aware of the importance of the emotional maturation of the student

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LEONARD CHRISTENSEN, M.D., Associate Professor of Ophthalmology, University of Oregon Medical School, Portland.
JEROME A. HILGER, M.D., Clinical Professor of Otolaryngology, University of Minnesota School of Medicine, Minneapolis.
WILLIAM F. HUGHES, JR., M.D., Professor of Ophthalmology, University of Illinois College of Medicine, Chicago.
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SCOTT M. SMITH, M.D., Professor of Anesthesiology and Head of Department, University of Utah School of Medicine, Salt Lake City.
ELWYN L. CADY, JR., LL.B., Medicolegal Consultant; Director, Law-Medicine Program, University of Kansas City School of Law.

The course covers a wide variety of subjects—presented by didactic lectures, panel discussions and televised demonstrations—but emphasizes especially the problems of Anesthesia in Children, in the Cardiac Patient and in Traumatic Surgery; the Autonomic Nervous System and Endotracheal Anesthesia.

which must be enhanced if he is to achieve a reliable understanding of motives, the central purpose in psychodynamics. This is best achieved through the teacher-student relationship primarily.

Naturally, there was quite a discussion of the spontaneity of voluntary action versus determinism by environmental conditioning. The agreement was upon a considerable range of practical uncertainty in the prediction of behavior but general agreement as to the importance of events of childhood and social experience in shaping the general course of personality development and in the formation of value judgments.

One valuable field of discussion was the relation of psychiatrists to general staff members of the teaching centers. This emphasizes the great importance of finding a place for psychiatry in the general medical attitude. Those trained in the basic sciences walk easily from department to department without any sense of being out of their field as in pathology, medicine, surgery, pediatrics, etc. As yet, basic science is just now including the science of human behavior and ultimately this estrangement, between psychiatrist and the general staff, one from the other, should become gradually lessened.

The book is a thoughtful one with a good collection of factual data as guides for decision in the resident program.—*S. A.*

Cure Your Nerves Yourself. By Louis E. Bisch. Published by Wilfred Funk, Inc., New York, New York. 247 pages. Price $3.50.

Some retail merchants attribute their success to the fact that they concentrate on selling articles that people really need or want. At the same time, they attempt to dissuade customers from buying useless or inappropriate goods. That principle, applied to psychiatry, is outlined in this book.

The author, who has devoted himself to psychiatry and neurology for 42 years, succeeds admirably in accomplishing the three objectives he lists for his book: (1) To prove to you that most cases of nerves do not require professional psychiatric treatment; (2) To help you discover for yourself if yours is such a case; (3) To show you how you can cure yourself.

The style is easy and informal, and nomenclature that would be confusing to a layman is omitted. The book can be recommended to any patient who would benefit from a quiet self-appraisal. Although it is designed to help those who feel that they may need psychiatric care, it would be beneficial to all who find themselves blaming "nerves" for the troubles that beset them.

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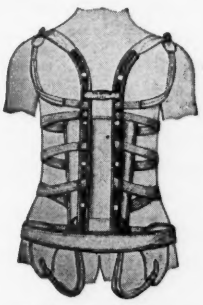

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"In all fairness to Strike It Rich, the program did not originate the idea of using human misery as a form of entertainment. Nero, for one, had a great time with it. If, today, a television show can thrive on misery, and if that's what viewers want to see, the sponsors of the show have good reason to keep it on the air.

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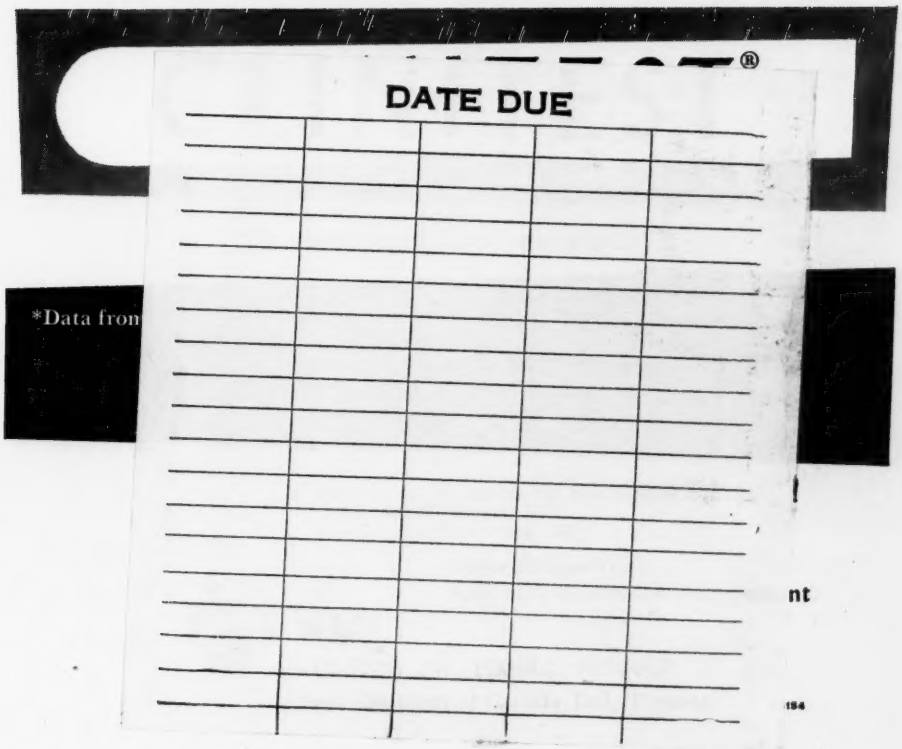

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